

# FLIGHT

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A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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BISMARCK'S MONUMENT ON THE MUGELBERGEN, AS SEEN FROM THE PARSEVAL AIRSHIP.—We are indebted to the Hon. Lady Eleanor G. Shelley, who was a passenger in this airship recently, for this picture. Some other photographs have already been published by us, which, in like manner, were received from Lady Shelley.

# EDITORIAL

**Britain  
Moving  
at Last.**

The section of Col. Seely's speech introducing the Army Estimates in the House of Commons last Monday, in which he dealt with the Government's policy in relation to aerial defence, can only be regarded as satisfactory from the point of view of those who have viewed with alarm the apparent neglect and supineness of officialdom in this great and pressing matter. On the principle that we can never have too much, we would much rather have seen the vote made up to a round half-million sterling, so as to have given us an air-corps which should have been before long of preponderating strength as compared with our possible antagonists, but we must learn to walk before we essay to run, and all things considered, we repeat that the Government is doing well in its provisions for aerial defence.

Practically everything upon which we have insisted as the irreducible minimum necessary to put our defences in a proper state of efficiency has been conceded and provided for. The British industry is to be encouraged and built up against the day when war will close the markets of the Continent against us; officers of the Air Corps will receive their initial instruction at the hands of private instructors in private flying schools—a point the necessity of which we have urged many a time—and the Army schools will exist to put the finishing touches on their attainments as military aviators. The Air-craft Factory is to be used for what we conceive to be its legitimate business—that of carrying out experimental work, making big repairs to machines and occasionally building aeroplanes and is not to take the place of private enterprise as a construction yard. We are to have 131 aeroplanes in commission as soon as they can be obtained, which is satisfactory as things are at the moment. The number, it is true, does not compare to advantage with that of the machines owned by France or even with that which it is understood Germany intends to acquire during the current year, but having due regard to the different conditions existing in Great Britain as compared with those of the Continent, there does not seem to be very much of which to complain. There is this one point, however, and that is that if we read Col. Seely aright the vote which is now being discussed includes provision for the Navy as well as for the Army. We have already noted the fact that it is in intention to purchase aeroplanes to the number of 131. In the course of his speech, Col. Seely said that the

"Military wing will consist of seven aeroplane squadrons, each containing twelve aeroplanes and a suitable number of officers to fly them. There will be an eighth squadron, consisting of balloons and kites. The balloons will consist of two dirigibles which now exist, two flights of kites, and the present free balloons, so long as they last and possibly longer, because we are told on all hands that the practice of observation in the air is very conveniently carried out from the safe platform of the free balloon. The headquarters of the naval wing will be established at Eastchurch, and there will be branches of the military wing at points not yet settled."

This only accounts for 84 machines, the remaining 47, presumably, being allocated to the naval wing. These 84 machines will undoubtedly form an excellent nucleus of an army flying corps, and it is from this point of view that we regard the scheme as being so satisfactory. Were there the least suspicion that the Government intended this number to represent the permanent establishment of the corps we should take a very different view indeed. Allowing for casualties and machines out of commission for one reason or another, of these 84 it is

# COMMENT.

probable that on any given day not more than 50 would be available for serious service—which, it needs not saying, is far too few in comparison with the numbers available to foreign Powers. Against this, it is true, must be set off the fact that although the corps is to be organised in these military and naval wings, in case of a military war the whole corps will be available for army use, and conversely should we at any time become involved in a purely naval conflict, the sea service would command the undivided force of the whole corps. We take it that the question has been very carefully thought out by the expert advisers of the Government, but we cannot help a sort of uneasy feeling that there is something wanting in such a system of organisation. His Majesty's marine, "soldier and sailor too," is an exceedingly fine fellow—none better among the whole world's fighting men—but to extend the principles of his training in the manner proposed for the flying corps seems, to the lay mind at least, to be carrying the principle a little far. We shall have to christen the flying corps the "Air Marines."

With regard to the purchase of aeroplanes, Col. Seely thus delivered himself:

"Already orders for a great many of these have gone out, and others are in process of negotiation. Not so many have been ordered from British manufacturers as we should wish, but that is because the technical members of my Committee, themselves flying men, realised, with the full approval of the whole Committee, that the first essential was efficiency and safety, and it is a fact that in many respects France has gone a long way ahead of us. We could not buy British machines—necessary though it is to encourage British manufacturers, because we cannot obtain machines from abroad in time of war—at the price of human life. Therefore we had to reduce the number of orders we had originally hoped to give to British firms. That difficulty will soon be overcome, no doubt, because there are a great many of the best brains at work endeavouring to make aeroplanes not only more speedy and efficient, but safe."

With all our anxiety for the fostering of the home industry—and readers of FLIGHT know well that it is one of our first concerns—we cannot avoid the admission that there is a great deal of sound policy in the Government's decision to go to France for a certain number of this first batch of machines. Our good friends across the Channel are undoubtedly ahead of us in the meantime, and on the principle that nothing but the best is good enough we must go to them for the best they can give us. But there must be no more of it after this. Indeed, we are inclined to the opinion that it would have been almost as well if the Government had stipulated that all aeroplanes purchased on its account should, at least, be built here, no matter what their genesis. Against that must be set the urgency of the case. In order that the hundred odd machines which will come from France might be built here, factories and plant would have to be erected, workmen imported from France and our own mechanics trained in the methods of up-to-date air-craft construction—and, as the proverb has it, while the grass grows the steed starves. Therefore, the only logical conclusion is that it was unavoidable in the present instance that we should have to go abroad. But if the Government would do the aeroplane industry, and incidentally itself, some good, it would formulate something of a settled policy which would indicate the probable permanent establishment of the Flying Corps as a minimum, which would give some approximation to the number of machines required year by year to keep it up to strength. Then our manufacturers would know for what to prepare and could make their plans accordingly.





CLEMENT GRESWELL  
"ARMON" & BLERIOT



L. SEYMOUR-METFORD  
"BLERIOT"



LEWIS TURNER  
"ARMON"



W. RIDLEY PRENTICE  
"VALKYRIE"



W.H. EWEN  
"DEPERDUESSIN"



W. SLACK  
"BLERIOT"



MARCEL DESOUTTER  
"BLERIOT"



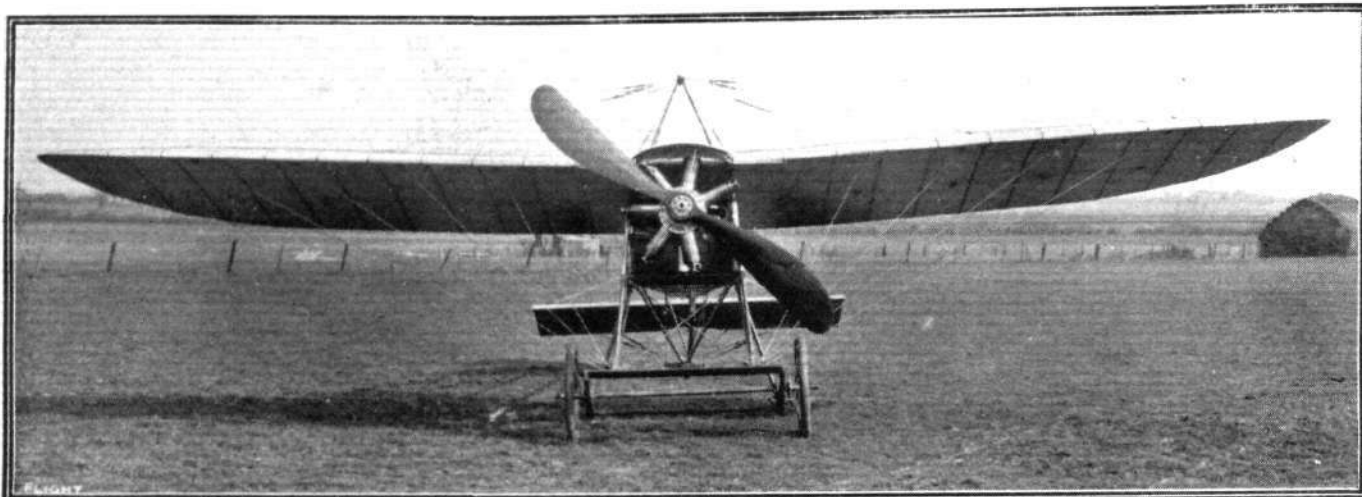
H. SALMET  
"BLERIOT"

Some well-known pilots at Hendon Aerodrome.

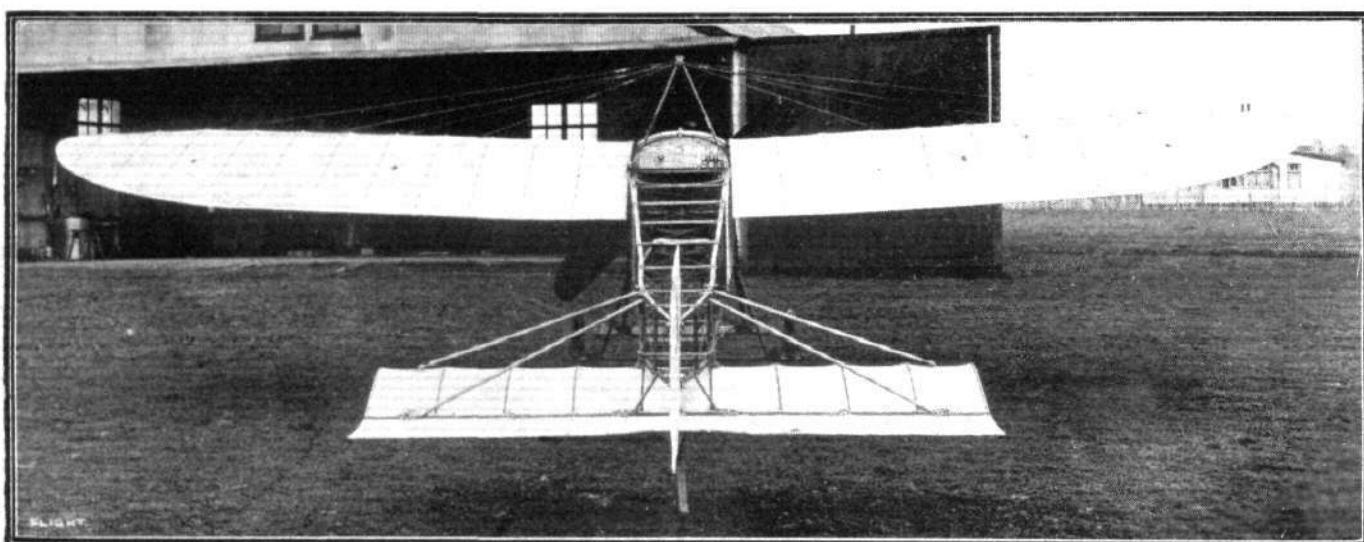
## THE SHORT MONOPLANE.

WHEN a firm have been so conspicuously and successfully associated with biplane construction as have Messrs. Short Brothers, it is a little difficult to suddenly attune the mind to the idea of a Short monoplane. Difficult or not, however, a monoplane has lately issued from those excellent workshops at Eastchurch, and although its design admittedly owes much to a prototype that has served as a

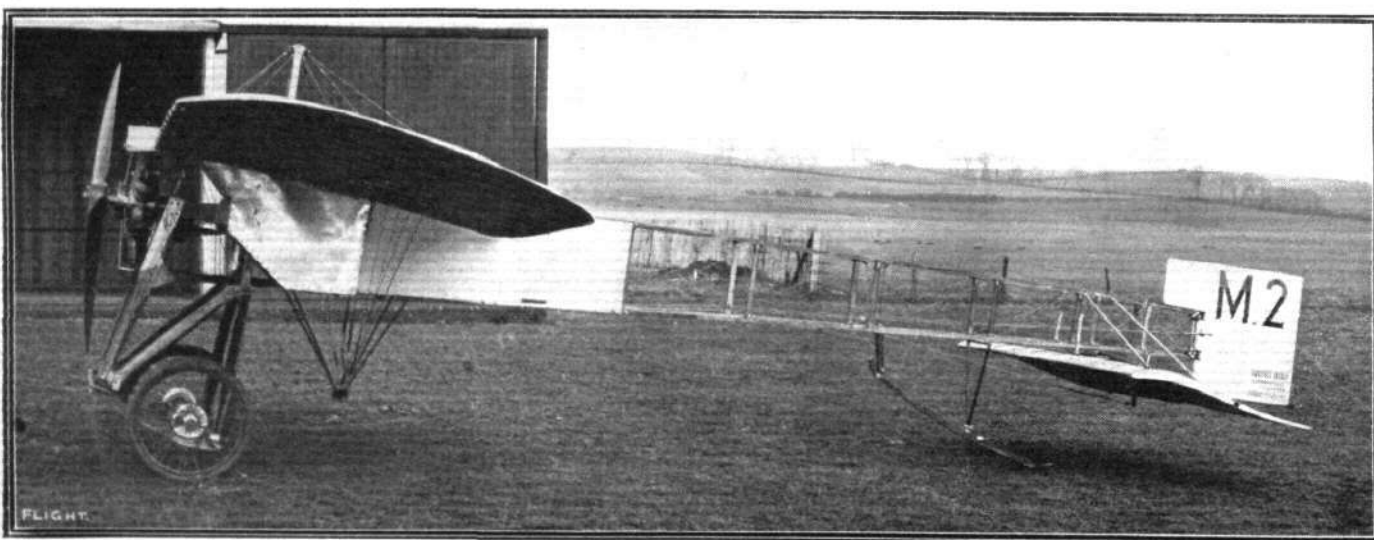
basis for more than one successful flyer, it has just as much of the Short originality as have those other typical aircraft with which the firm's name is associated. Strength and solidity, undoubtedly, were the chief points in the minds of the designers in the preparation of this new machine, and these features, too, are precisely those that the whole aviation world expects to see exemplified in any Short product.



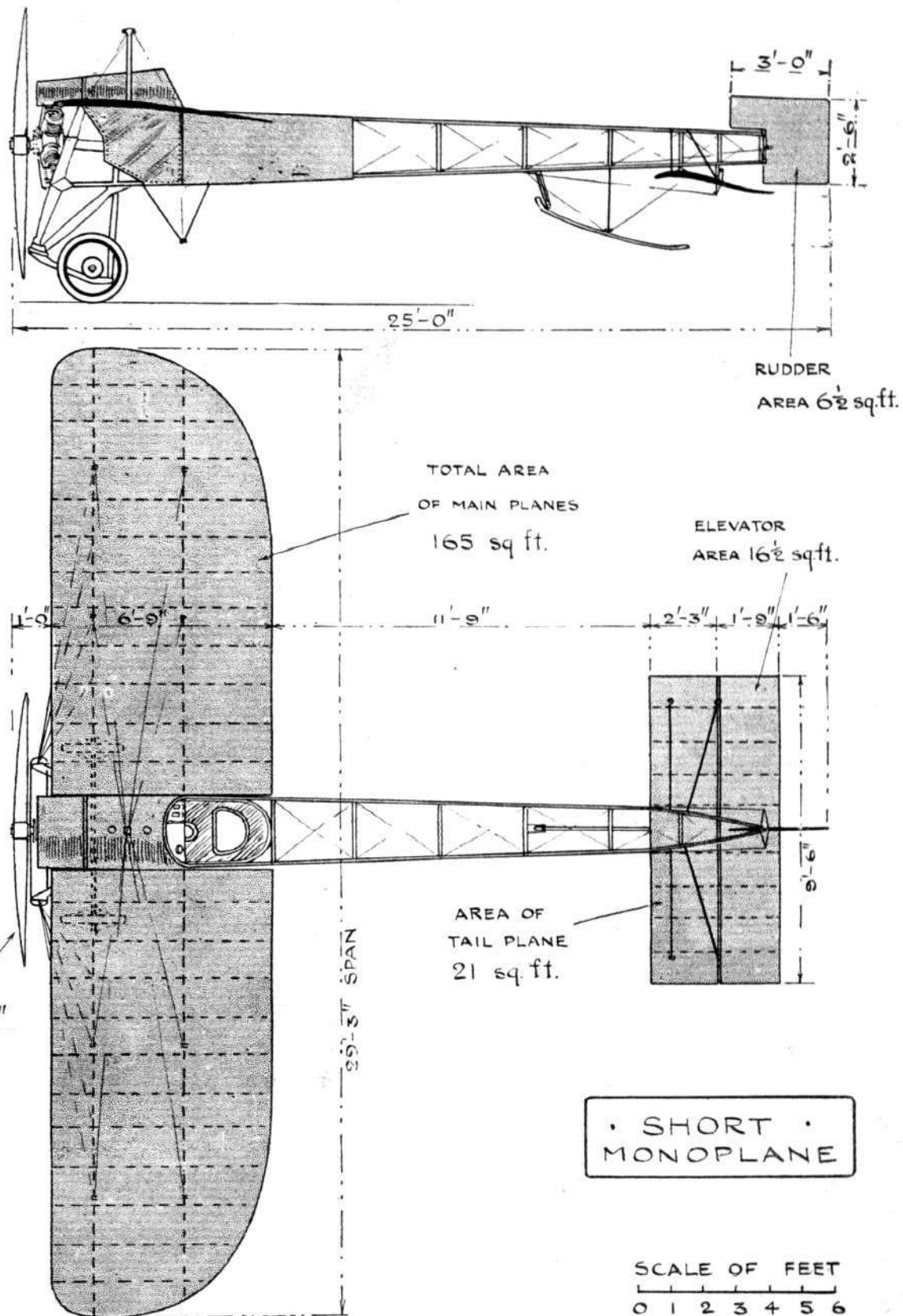
The Short monoplane, front view.



The Short monoplane, back view.



The Short monoplane, side view.



THE SHORT MONOPLANE.—Plan and elevation to scale.

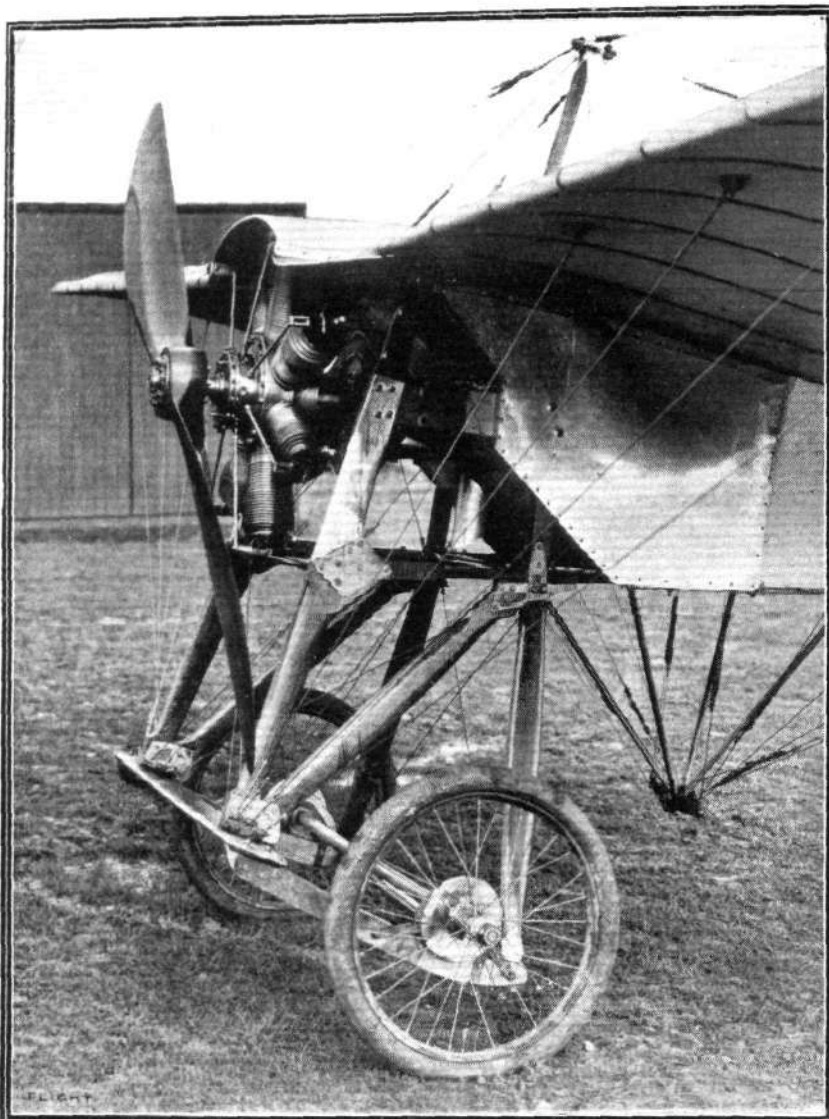


The main body is little different from that employed on the Blériot, and the same system of bracing is used. At the front end, however, it is different, being arranged for the mounting of the engine without any support between the propeller and crank case, and for the application of the new type of undercarriage with which the machine is equipped. This latter is of the wheel and skid type. Two sturdy ashstruts extend downwards and forwards from the points at which the main wing spars join the fuselage and are joined at their lower extremities by a horizontal *planche*. To this the two skids are applied, their rear ends being supported by subsidiary struts from the bottom of the main body. Diagonal struts further strengthen the structure.

In common with other forms of landing gear of the same type, especially amongst those exhibited at the last Aero Show in Paris, the skids show signs of suppression. In many of the French machines referred to, the skids had grown so small that, were the wheels to fail, they could scarcely be relied on to provide that easy run over the ground necessary for the safety of the machine. In the Short chassis, however, this extreme is avoided.

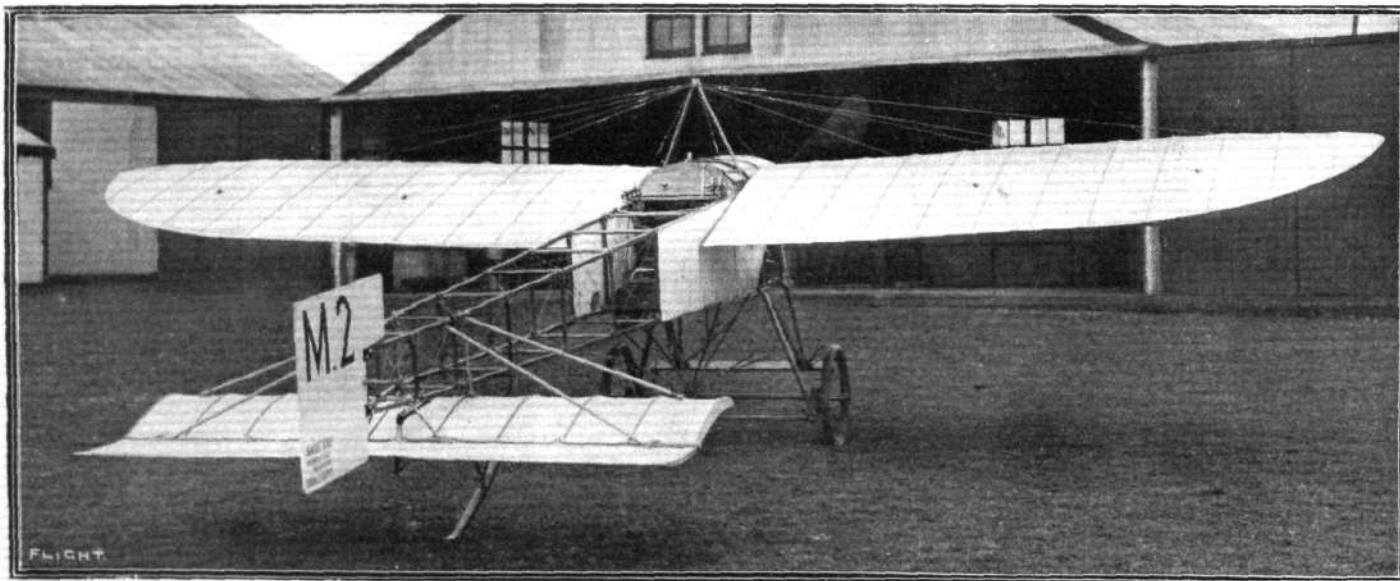
At the front end of the body is mounted the motor, direct coupled to a Chauvière type propeller, a hood being arranged above it so as to afford protection for the pilot against oil and exhaust products thrown off by it while in operation. The wings, much of the same size and shape as those of the Blériot, are trussed to the landing chassis by eight strong stranded steel cables, four to each wing. So strong is the wing staying, that structural failure in this section of the machine would seem almost an impossibility. In their internal construction, too, pains have been taken to prevent the ribs having a tendency to split at the webs left by the drilling-out process. Warping is relied on to maintain lateral equilibrium, the rear spars being deflected by eight wires, four to each, proceeding from an inverted tower of steel tubing applied below the body. The weight of each wing, when the machine is stationary, is supported by four wires from a tubular *cabane*.

Arranged before the pilot, so as to form a type of scuttle dash, are the fuel-tanks. These terminate in an inclined dashboard, where are fitted the switch, the petrol-gauge, and the oil feed-gauges, all well within reach of the pilot. A rectangular cambered surface, to the back of which is hinged a flap cambered in the reserve sense and serving as elevator, comprise the tail unit. This is supported clear of the ground, by a long universally-jointed skid attached to the body at the forward end by elastic bands. Both the rudder and the elevator are actuated by wires from the controlling organs attached to pressed-steel cranks. The controls themselves are almost identical with the original Blériot system, a pivoted foot-bar operating the



Detailed photograph of the front section of the Short monoplane, showing details of the landing carriage and the mounting of the Gnome engine.

rudder and a universally-jointed vertical pillar, surmounted by a small hand-wheel, governing the machine's attitude and the wing warping. Indeed, the only difference noticeable is that the typical aluminium dome of the Blériot control is replaced by simple steel cranks. Its flying speed is approximately 60 miles an hour.



The Short monoplane, three-quarter back view.

## AN INTERNATIONAL PARLIAMENT OF FLYING.

A PERUSAL of the proceedings of the conference of the *Fédération Aéronautique Internationale*, held under the Presidentship of Mr. Roger W. Wallace, K.C., the Chairman of the Royal Aero Club, at Rome last November, which have just made their appearance as a somewhat bulky work of over a hundred pages, induces the reflection that in the Federation, aviation possesses for its service a far-reaching body, whose scope goes far beyond the ordinary activities which are generally attributed to organisations of its kind.

For example, the subjects discussed by the Conference ranged from the structural characteristics of aeroplanes to international law, and from maps to finance, and it was all useful discussion with a real object in view. It is not our purpose to enter into anything in the shape of a lengthy review of the proceedings as outlined by the official document which is now before us. Even to give a digest of the many subjects which were debated would occupy more space than we have at our disposal and, besides, much of the work was necessarily of the dry-as-dust variety which, while it has to be done, and done seriously and well, is apt to become boring to the ordinary individual whose interests are centred rather on the actualities of flight as differentiated from the problems of administration. But there are one or two phases of the Federation's work to which it is fitting we should draw attention in passing.

Most people, we imagine, have an impression that the Federation is a body representative of all nations, which is almost solely concerned with the drawing up and enforcing of regulations for the governance of the sport—that it is, in fact, a species of international Jockey Club of aviation, which deals with infractions of its sports regulations and suspends individuals or clubs when occasion may arise. True, it does exercise such functions, or rather it delegates these powers to the representative aero clubs of the nations and enforces their decrees, but as indeed we have already indicated, its work goes a long way farther than the exercise of the very necessary function of codifying the rules of the sport. It has much more serious affairs to demand its attention. One of the most important subjects with which the Federation has charged itself is the debating of international law of the air and to the end that the world of aviation should be prepared against the day—now not very far distant—when governments must tackle the question in real earnest, it has constituted, what it has had in mind for some years, a Commission of Aeronautical Law. This commission is to consist of two representatives of each country affiliated to the Federation, one of whom will be a practical aviator and the other a lawyer, for of necessity both law technique will have to be discussed. This commission must in no way be confounded with that amateur commission which met in Paris last year, and whose proceedings we made the subject of drastic criticism in this column. The two are as wide as the Poles asunder, for the one consisted of more or less known lawyers, with no practical knowledge of flight to guide them, and treated the subject of codification of aerial law purely from the standpoint of the legal mind, while the body constituted by the Federation will have the advantage of first hand knowledge of what it is doing both from the practical and legal points of view.

It scarcely needs pointing the moral that here is an

excellent and an essential work to be done. Aviation has progressed so rapidly and has so greatly widened its scope within the past year or two, that already frontiers may almost be said to be non-existent. That, we think, is amply borne out by the number of cross-Channel flights that have been successfully achieved, while it is self-evident that the machine which is capable of remaining in the air for half-a-dozen hours, and travelling a mere matter of five hundred or so miles in the time, has become what may quite justly be described as an international vehicle of locomotion. It is quite true that hitherto no difficulties have arisen between the nations as a result of violation of frontiers, but that, we think, is mainly due to the fact that, much as we have progressed, we have not yet really crossed the threshold of commercial aviation. That is to say, all the work that has been done, and is in the doing, is of more or less experimental type, and is in the hands of men with a great sense of responsibility, who carefully avoid doing what they should not. But it only requires a very few crossings of continental boundary lines to bring things very much to a head, because of the many considerations of defence, customs and so forth, involved. Supposing something of the sort to happen all round, and each country to exercise its undoubted rights of sovereignty to the making of its own laws. Is it possible to imagine anything more chaotic than the probable result? The probability is that international travel by the way of the air would become almost impossible, the result of which to the movement and to the world's industry needs no indicating. It is against such a *contretemps* as this that the commission on Aeronautical Law will protect the movement. Very many instances might be quoted to show that new movements have been terribly hampered at their inception by panic legislation, undertaken domestically without the aid and guidance of balanced expert advice. Motoring is a case in point, though the ultimate effect upon it has not been nearly as serious as would be that of repressive laws directed against aviation.

Supposing that the moment there was seen to be a serious prospect of the mechanically-propelled vehicle becoming a practical proposition, a similar international commission to the one we are discussing had been formed for the purpose of drawing up a sort of sealed pattern code of laws for its governance, domestic and international. Drafted by lawyers of repute, assisted by expert practical motorists, we might easily have been saved the years of uphill fighting which had to be done before we had legislation which was even reasonably permissive. We might have had laws in every country, identical save for the inevitable small modifications necessary to adapt them to local conditions, and much trouble might have been saved to everyone in the earlier stages of the movement. So it is, to even a greater degree, in the case of aviation, except that the Federation is wisely providing against certainties.

When the governments realise that each and all must make laws to govern the use of the air, they will have for their guidance a draft code, agreed upon by the lawyers and those whom it will most closely concern—a code at once embracing, sane and sensible, and not more repressive than is necessary to safeguard the various interests of the communities. If the Federation were doing nothing else, it would still deserve well of aviation.



# THE AVIATION GRANT.

## THE NEW FLYING CORPS.

VERY explicit and, in most respects, gratifying, was the explanation of Colonel Seely, the Under-Secretary of State for War, in the House of Commons, on Monday night, when dealing with the aviation section of the Army Estimates. The subject is dealt with editorially elsewhere, and below will be found Colonel Seely's remarks upon the subject. He said:—

"A scheme has been prepared by the technical committee, which has been accepted by the advisory committee appointed in that connection, and has this morning been approved by the Prime Minister. It will now be carried into effect.

"There is to be one Flying Corps, embracing soldiers, sailors, and civilians—all who can fly, and will undertake the obligation to serve their country in time of war in any part of the world.

"No man shall hold executive rank in the Flying Corps unless he is himself an expert flyer. The present air battalion ceases to exist, and part of it is absorbed in the new organisation. The corps will be one corps, and, as far as possible, all the officers will be paid alike and treated alike, because they will run the same risks, and have the advantage of doing the same daring deeds. In a purely land war the whole Flying Corps will be available, and in a purely naval war the whole Flying Corps will also be available.

"The headquarters of the Flying Corps will be on Salisbury Plain, and a large tract of land has been purchased for the purpose, at a cost of about £90,000.

"In the first instance, accommodation will be provided for sixty officers at the school at any one time. There are to be three terms of four months each, and we propose, all being well, to pass through 180 officers in each year. In addition, there will be non-commissioned officers and mechanics of various kinds. If an officer wants to join the Flying Corps, he has first to get the consent and approval of the military authorities. Then he has to be passed by the doctor. Then he has to obtain the Royal Aero Club certificate. We do not propose to use the Central Flying School for teaching officers; we propose they should learn the elements of the air elsewhere, and then come to the Flying School for the more advanced course.

"After receiving the Royal Aero Club certificate, and before presenting themselves, each will receive £75, which will cover the cost. This particular arrangement has been in force for some time past, and between twenty and thirty officers have received £75 each already. They will then be attached to the Central Air School, and there they go through a course of four months.

"They will learn progressive flying; mechanics and construction in all its details; meteorological observations of the air; navigation and flying by compass; cross-country flights; photography from the air; signalling by all methods; and, most important, the types of warships of all nations. After this course an officer, for he will be an officer of the Air Corps, whatever source he came from originally, whether Army, Navy, or civilian, will either join the military wing or the naval wing, or else he may go straight to the Reserve.

"The military wing will consist of seven aeroplane squadrons, each containing twelve aeroplanes and a suitable number of officers to fly them. There will be an eighth squadron, consisting of balloons and kites. The balloons will consist of two dirigibles which now exist, two flights of kites, and the present free balloons, so long as they last and possibly longer, because we are told on all hands that the practice of observation in the air is very conveniently carried out from the safe platform of the free balloon. The headquarters of the naval wing will be established at Eastchurch, and there will be branches of the military wings at points not yet settled.

"In the reserve there will be two classes. Those belonging to the first will perform cross-country flights and receive a retaining fee. The second reserve will consist of those who have passed through the course but who do not want to go through these flights or receive a retaining fee. Both the Army and Navy wing of the air corps will always be on a war footing, and the peace and war establishment will be the same. The primary function of the Army

Air Corps Factory will be experiments and building experimental machinery, making big repairs to machines where it is thought desirable, and sometimes building machines. Its primary duty, however, will be the training in expert knowledge of the numerous mechanics required for this new service.

"I shall be asked in regard to this ambitious scheme what really is going to be the total number of men who fly, and how many aeroplanes have you got. The scheme involves the purchase of 131 aeroplanes.

"I am not sure whether we shall be able to buy all this year. This is not a matter of expense at all. Already orders for a great many of these have gone out, and others are in process of negotiation. Not so many have been ordered from British manufacturers as we should wish, but that is because the technical members of my Committee, themselves flying men, realised, with the full approval of the whole Committee, that the first essential was efficiency and safety, and it is a fact that in many respects France has gone a long way ahead of us. We could not buy British machines—necessary though it is to encourage British manufacturers, because we cannot obtain machines from abroad in time of war—at the price of human life. Therefore we had to reduce the number of orders we had originally hoped to give to British firms. That difficulty will soon be overcome, no doubt, because there are a great many of the best brains at work endeavouring to make aeroplanes not only more speedy and efficient, but safe.

"The risks these officers will run will be very great. The insurance rates are very high, but it is some consolation to know that in France they have enormously increased the safety of learning to fly. I know one particular school where they have covered 60,000 kilometres without accident of any kind, and there may be others that will show records as good, or almost as good. It is to be hoped, therefore, that the risks will be reduced. But they will still be very great, and for that reason I trust the House of Commons will not grudge the expense involved in making adequate payment to those officers, and giving an adequate scale of pension in the event of their being rendered unable to continue their service.

"I may take it that I may rely upon the House for every assistance in this matter, if for no other reason than that of the dangers in this business. One hundred and thirty-three officers are required for the military wing and thirty or forty for the naval wing. In the reserve the number we shall work up to will depend on how the science progresses in the near future. We have not got the 133 military officers, but we have no doubt that many will volunteer.

"That brings me to the point as to why we suggested that these officers should learn to fly at private flying schools. There are two reasons. First, because it is so desirable that we should encourage private effort as far as may be, and secondly, because we believe there is less risk of accident in the initial stages if we proceed by this method. After learning the elementary art of flying officers will come to the Central Flying School, where they will not run the same risks, because they will have learned the elements already.

"For the moment any officer who is approved by his commanding officer and the proper military authorities, and is passed as fit, and has obtained his certificate, will obtain £75, because we are very short of members. But when we get up to our full numbers the phrase 'Let 'em all come,' which now applies will no longer apply.

"In regard to the encouragement of private enterprise, we propose to do it, not only by getting officers to obtain certificates privately, but also by the purchase of aeroplanes in this country as far as possible, and by renting sheds and landing rights in different aerodromes.

"Scientific research will be continued in co-operation with the Advisory Committee set up by the Prime Minister.

"This is an ambitious scheme, and, possibly, owing to the novelty of the science with which we are dealing, we have made mistakes, but we hope we have laid the foundations upon which to build, so that this country in the long run will be able to hold her place in the air as she has by land and sea."



### The Army and Navy Flying School.

SOME tentative details are now available respecting the Government Flying School for Army and Navy Officers which is to be established at Upavon, on Salisbury Plain. The plans which have been drawn up allow accommodation for 180 persons, while the permanent officials will be the commandant and an adjutant, two

chief instructors and five officers. The buildings will cost nearly £40,000, and will include 14 aeroplane sheds, repair and engineer shops, a garage for motor cars, and hospital accommodation. There will be room for 68 pupils, to be drawn equally from the Army and Navy. The officers are to have separate quarters, while for the non-commissioned officers, who will number 63, a special block of buildings will be set apart.



# THE INSTITUTION OF AUTOMOBILE ENGINEERS.

Abstract of Paper to be discussed on Wednesday, March 13th, 1912, at the Institution of Mechanical Engineers, at 8 o'clock p.m.

## AEROPLANE UNDERCARRIAGES.

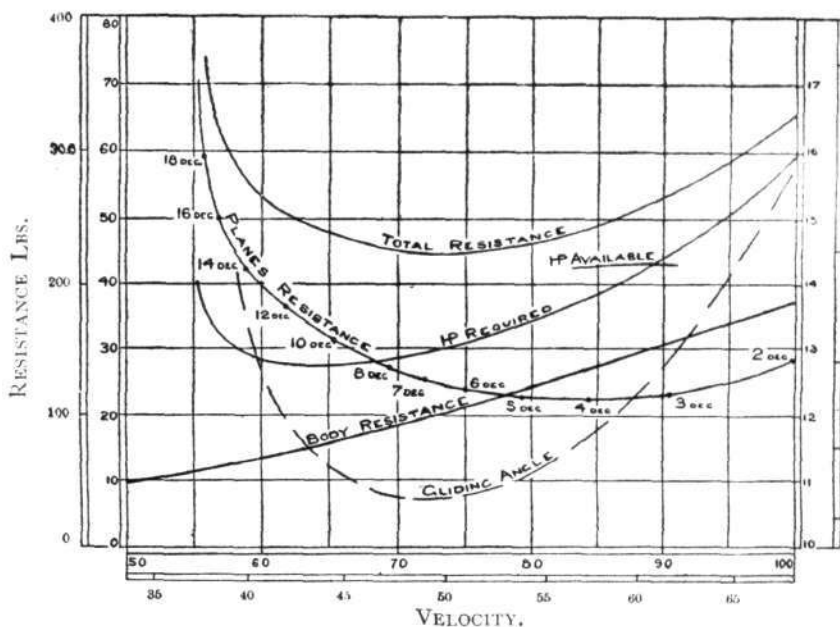
By G. DE HAVILLAND.

In the first place, it will be as well to consider the principles of alighting.

One of the most important rules in connection with this is to bring the machine head to wind before actually touching the ground, as the speed relative to the earth is thereby decreased, and the machine quickly comes to rest. Landing in a side-wind puts heavy lateral strains on the undercarriage, and in a following-wind the speed may be dangerously high. In the case of a machine fitted with brakes and some efficient form of front skid, the danger of alighting with the wind is considerably reduced; and although the rule of landing against the wind should be observed whenever possible, there may be times when this cannot be managed, as in the case of a forced descent when flying low.

nearly vertical as possible. The critical alighting angle is shown on the lift and drift chart of the plane (Fig. 1) which, in this case, refers to a two-seated Blériot monoplane. This and some of the other charts have been prepared for me by Mr. Watts, of the Army Aircraft Factory. It will be noticed that when an angle of about 15° has been reached, the lift begins rapidly to fall off, while the drift increases, and it is therefore useless to tilt the machine to any greater angle. On reference to the Resistance and Power Chart, it will be noticed that this angle gives a speed of approximately 38 miles per hour, which, in this case, is the lowest possible speed in still air.

In modern machines, high speed is obtained more by the reduction of head resistance than by using high powers and reducing the



ANGLE OF PLANES TO FLIGHT PATH = $\alpha$ .				ANGLE OF AXIS OF MACHINE TO FLIGHT PATH = $\beta$ .				ANGLE OF AXIS OF MACHINE TO HORIZONTAL = $\gamma$ .			
A.	B.	C.	D.	E.	F.	G.	H.	MACHINE GLIDING:			
$\alpha = 14^\circ$	$\alpha = 13^\circ$	$\alpha = 12^\circ$	$\alpha = 11^\circ$	$\alpha = 10^\circ$	$\alpha = 9^\circ$	$\alpha = 8^\circ$		1 IN 5'3."			
$\beta = 10^\circ$	$\beta = 9^\circ$	$\beta = 8^\circ$	$\beta = 7^\circ$	$\beta = 6^\circ$	$\beta = 5^\circ$	$\beta = 4^\circ$		$\alpha = 7^\circ \quad \beta = 3^\circ \quad \gamma = -8^\circ$			
$\gamma = 10^\circ$	$\gamma = 8^\circ$	$\gamma = 6^\circ$	$\gamma = 4^\circ$	$\gamma = 2^\circ$	$\gamma = -1^\circ$	$\gamma = -4^\circ$					

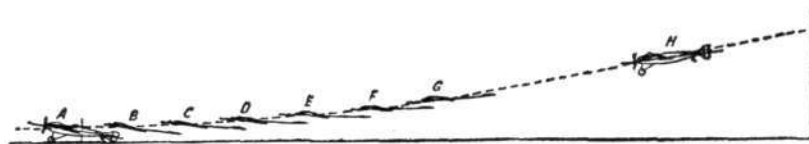
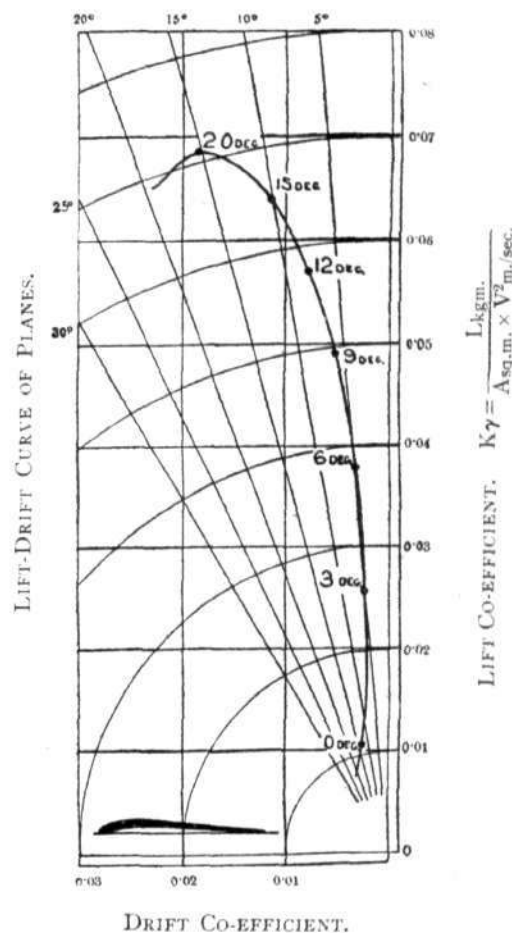


DIAGRAM SHOWING LANDING OF TYPICAL MONOPLANE.

A MACHINE LANDS. FLIGHT PATH HORIZONTAL. WHEELS AND SKID TOUCH SIMULTANEOUSLY.

Fig. 1



DRIFT CO-EFFICIENT.

$$K_x = \frac{D_{\text{kgm.}}}{A_{\text{sq.m.}} \times V_{\text{m./sec.}}^2}$$

When flying across country, a height of at least 1,000 ft. should be maintained, in order to give sufficient time to choose a suitable landing-ground in case of engine-failure. When descending with the power cut off, it is always advisable to plane down at an angle rather steeper than the best gliding-angle of the machine, as the controls are then more sensitive, owing to the higher speed, while in gusty winds there may be a certain loss of stability if the speed is not kept reasonably high. When a few feet from the ground, the machine is gradually levelled up until the angle of incidence of the planes has almost reached the maximum for lift, and if this manoeuvre is properly timed, the machine will be slowing up and gradually dropping until the wheels make contact with the ground, without perceptible shock. In the case of a forced landing in a place where the ground is very soft, or where the wheels are liable to meet with serious forward resistance, it is advisable to level up and take "way" off the machine, and thus diminish the horizontal velocity, so that the actual landing will be as

area of supporting surfaces, which means that the machine possesses a greater speed range. It is doubtful, in the author's opinion, whether special devices will be provided for enabling the surface to be varied in extent, as this would entail extra weight and complication.

If the power plant of an aeroplane were infallible as regards reliability, there would be little necessity for providing a more suitable undercarriage than that in use at the present time, as the pilot would always choose convenient and safe ground for alighting. Even now, engine breakdowns are more the exception than the rule compared with the state of affairs a comparatively short time ago, but as there will always be the possibility of forced landings, the machine must be provided with the best possible form of undercarriage.

It will now be as well to consider the conditions that should be fulfilled by the ideal undercarriage:—

(a) Its first duty is to allow the machine to attain its flying speed

while on the ground. There must be the least possible resistance while rolling in order that the machine may accelerate to the required speed as quickly as possible.

(b) It must be arranged to give a high degree of stability in a fore and aft direction, as well as laterally, while travelling at high speed over uneven ground.

(c) It must be efficiently sprung to eliminate rolling shocks.

(d) The machine must be capable of being steered on the ground without the aid of the propeller blast.

(e) Some efficient form of brake must be provided.

(f) It must be designed with a view to easy repairs.

[Most of the above conditions apply to rolling and taking off from the ground; the following are connected with alighting]:—

(g) It must be provided with a suitable device for absorbing the shocks of landing.

(h) It must be capable of withstanding the considerable side strains attendant upon landing in a broadside wind.

(i) It must be provided with some form of leading skid or wheel, which is normally clear of the ground, but which is sufficient in all cases to prevent the machine turning over.

While considering these features there are other important points that must not be overlooked. While an aeroplane is actually flying,

while other types of machine may present difficulties in a different direction.

However, the generally accepted arrangement for practically any type of machine is to place the main wheels approximately under the centre of gravity and a rear support, which generally takes the form of a skid, is provided in front of the main wheels. When resting on the ground most of the weight is taken by the main wheels, and a comparatively small loading given to the rear skid.

The height of the undercarriage is determined by the propeller, which must be allowed suitable clearance from the ground under all conditions. It is advisable, therefore, to place the propeller as high as possible in order to keep the centre of gravity in the vertical line low down, but there are other principles of design which govern the position of the propeller within certain limits. In order to leave the ground, or to alight, at a speed below that normally attained when flying, it is necessary to increase the angle of incidence, and this must be allowed for by so arranging the rear skid that the machine lies at an angle of about  $18^\circ$ ; the front skid or wheel will then be well clear of the ground, and will only come into action when the machine pitches forward. The weight supported by the rear skid depends upon whether a lifting or non-lifting tail plane is used, but in any case, the skid must be so loaded as to leave the ground in

a short distance, as otherwise it will prevent rapid acceleration when starting. Also, a heavy load on the rear skid means that the main wheels are some distance in front of the centre of gravity, and this tends to tilt the machine back when landing, thus causing it to rise again owing to its suddenly increased angle, and

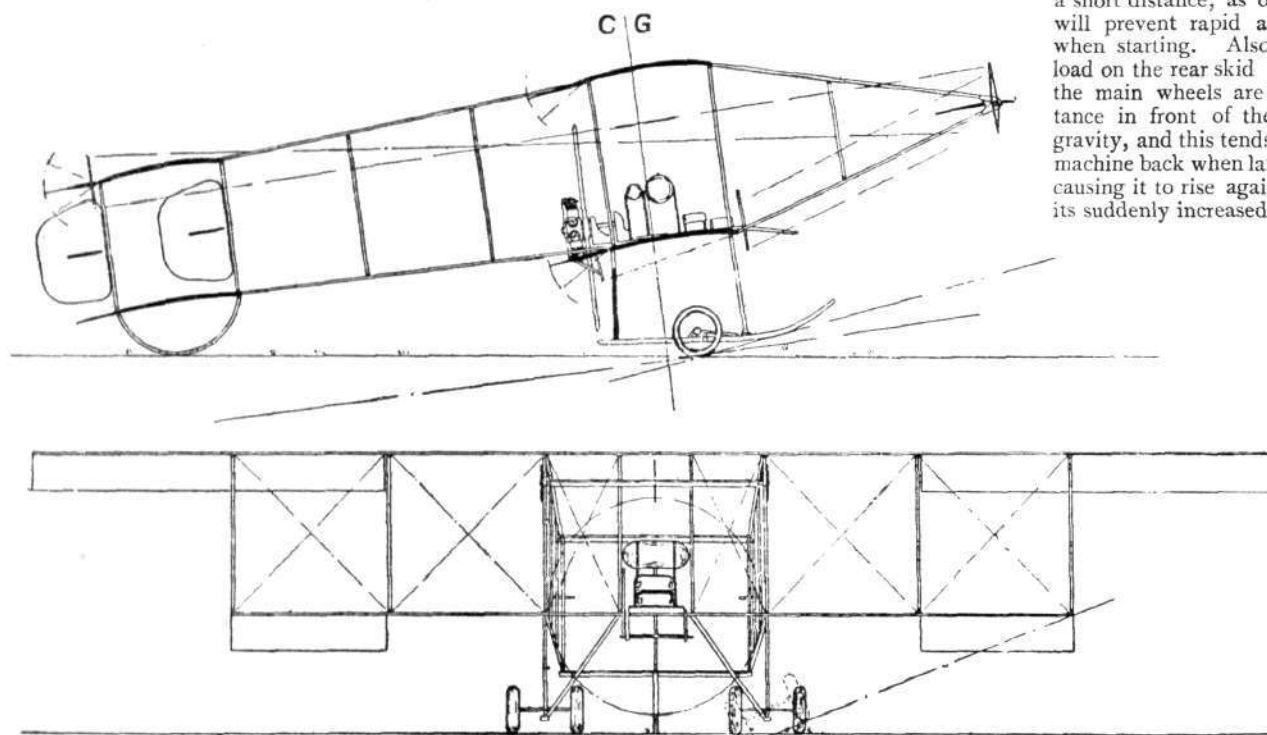


Fig. 2.—Farman Biplane.

the undercarriage is merely an encumbrance in the form of weight and head resistance, and although it is obviously desirable to cut weight to a minimum wherever possible, this is not the place where a great reduction should be made, as it is practically impossible to estimate correctly the strains to which the various members are subjected, and therefore a liberal factor of safety must be allowed.

Improvement lies more in the direction of simplifying the design, thus reducing head resistance and weight, at the same time fulfilling the conditions of the ideal undercarriage as far as possible.

It is no easy matter to decide what constitutes unsuitable ground for landing. If it was desired that a machine should alight safely in a cornfield, on the side of a steep hill, or amongst ditches and marsh ground, the undercarriage would assume impossible dimensions as regards weight and size. It is reasonable, however, to assume that the ground will be of uneven surface, such as ploughed land, sand, or long grass on a medium incline.

The landing gear is seldom subjected to abnormal strains in landing, provided, of course, that the pilot is fairly experienced, but in rolling over bad ground after landing or before getting off, it may have to withstand far greater shocks, especially when rolling with a following wind, in which case the normal flying speed of the machine will be exceeded.

The design of an undercarriage is, to a large extent, governed by the type of machine to which it is fitted. The popular type of single tractor machine offers certain difficulties to the fitting of a reliable gear, chiefly owing to the position of the tractor, which prevents a substantial skid arrangement being provided in front,

in this manner the machine may rebound several times before coming to rest. With a directional tail, or one giving slight lift, the construction of the framework between this member and the main planes can be very light, as the bending moment is small; but, if it has to withstand the shocks transmitted by a heavily loaded skid, weight must be added to give it sufficient strength. It is therefore apparent that the main rolling wheels should be nearly under the centre of gravity.

## Types of Undercarriage.

The Wright aeroplane is chiefly interesting from the fact that it was the first practical machine in which a rigid framework was provided beneath the planes in place of the flexibly mounted undercarriages adopted by the French constructors at about the same period, the outcome of these two systems being the combination of skids and wheels in later types of machines.

The chief advantage of this system is, that it provides a rigid structure to which the main lifting-wires may be fixed, these wires also being effective in taking any side-strains imposed on the undercarriage itself.

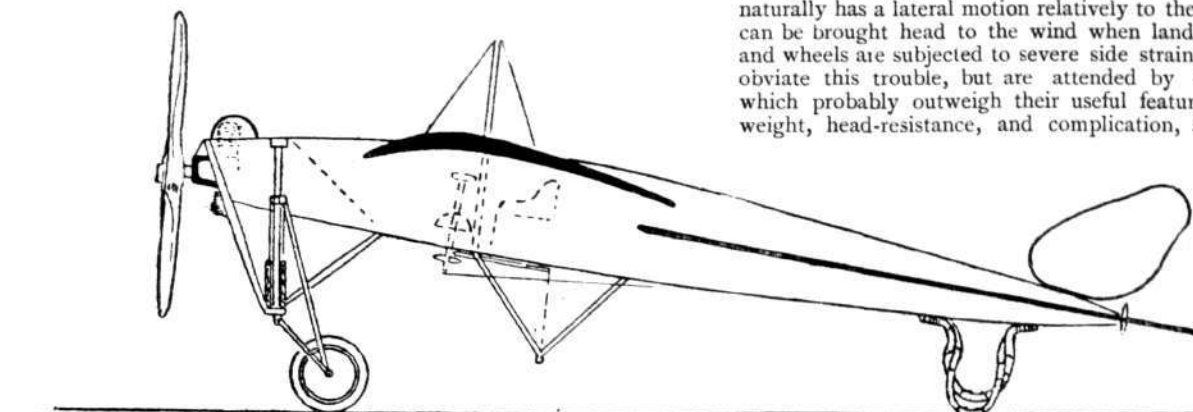
**Farman Biplane.**—Farman was the first to combine wheels with skids, and this type of undercarriage has found favour with a large number of constructors. Ash is chiefly used, and the machine is supported from the skids by four or more struts, which are wired-up rigidly to the main planes. The skids are 9 feet apart, and each carries a pair of rolling-wheels, which are attached by rubber bands. A short radius-rod allows the wheels a certain amount of lateral



motion. The maximum vertical travel of the wheels is about 8 inches, but it is seldom that the skids come in contact with the ground. It is certainly not advisable that they should do so, as the shocks transmitted to the whole machine would be excessive. The rear skid carries a weight of about 200 lbs., but owing to the propeller slip stream passing over the lifting-tail planes, the skid leaves the ground in a few yards. A machine which has a weight-carrying

rubber cables. The tail of the machine is supported by a skid of bent cane, which carries a comparatively light load. The absence of any kind of front skid makes this type of undercarriage unsuitable for use on very uneven ground, as there is nothing to prevent the machine turning over should the wheels be suddenly retarded by an obstruction, or by sinking into soft ground.

Whether swivelling wheels as adopted by Blériot are desirable, is a very debatable point. When flying in a side wind, the machine naturally has a lateral motion relatively to the ground and, unless it can be brought head to the wind when landing, the undercarriage and wheels are subjected to severe side strains. Swivelling wheels obviate this trouble, but are attended by certain disadvantages which probably outweigh their useful feature. These are—extra weight, head-resistance, and complication, and also difficulty in steering on the ground because, if it is anything but level, the machine always tends to run down hill. The more useful practice of making wheels with wide hubs sufficiently strong to withstand side strains and do away with



tail-plane has the advantage of not tending to pitch forward when landing on soft ground, owing to the weight being well back in relation to the position of the wheels; but, owing to its disadvantages from an aerodynamic point of view, the weight-carrying tail is giving place to the purely directional tail. In the latter case there is practically no lift given to the rear part of the machine by the propeller-slip, and therefore the wheels must be placed farther back, in order to diminish the weight on the rear skid, which makes for a greater tendency to pitch forward when landing. It was probably for this reason that the Blériot monoplane entered for the French Military Trials was fitted with a weight-carrying tail, although this type had previously been abandoned in favour of a direc-

swivelling devices enables the machine to be steered on the ground with certainty, and makes for a cleaner and lighter design. It is interesting to note that in the latest type of Blériot the undercarriage has been

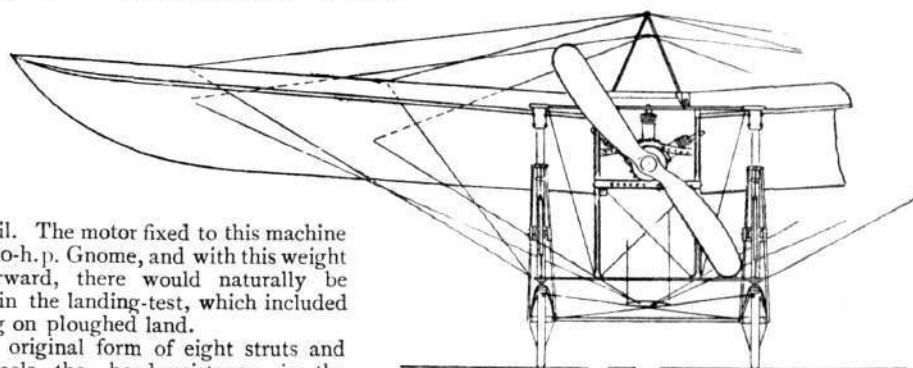
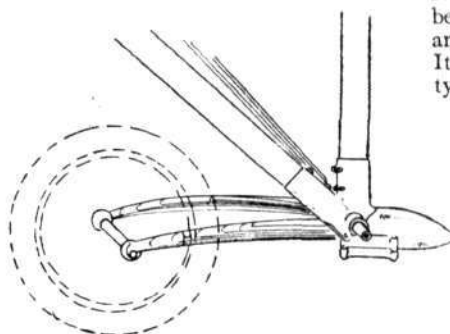


Fig. 3.—Blériot Monoplane.

tional tail. The motor fixed to this machine was a 140-h.p. Gnome, and with this weight well forward, there would naturally be trouble in the landing-test, which included alighting on ploughed land.

In its original form of eight struts and four wheels, the head-resistance in the Farman type was excessive, but in the latest models the number of struts has been halved.

**Blériot Monoplane**—The two main rolling-wheels have a track of about 6 feet, and are allowed a vertical travel of 12 in., the suspension being by rubber cable. The wheels are arranged to swivel through about 45°, and are held in the normal position by light



#### A North Sea Airship Project.

It is reported that the Hamburg-Amerika line intends to shortly secure a number of dirigibles with a view to starting an airship service over the North Sea. The report states that sheds will shortly be constructed at Wilhelmshaven, Hamburg, Heligoland, Kiel and Bremen.

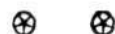
#### "Parseval XI" Out for Seventeen Hours.

ON the 19th ult. at 4.35 in the afternoon "Parseval XI" with eight persons on board started from Tegel and was cruising for seventeen hours. On landing the following morning at 9.50 there was still sufficient petrol on board for eight hours.

On Monday the airship made the stipulated height test by cruising for a couple of hours with ten persons on board, at an altitude of 1,500 metres.

greatly simplified by the adoption of non-swivelling wheels. These are shown in the sketch. The head-resistance and weight are both rather high in the early types.

(To be concluded.)



#### Eleven on "Parseval VI."

LEAVING Bitterfeld at 1.37 on the afternoon of the 20th ult. with eleven passengers on board, "Parseval VI" cruised over to Johannisthal, where a landing was effected at 3.50 p.m.

#### "Victoria Louise" Goes to Frankfort.

ON Monday the new Zeppelin cruiser, "Victoria Louise," with twenty persons on board, left Friedrichshafen at a quarter to ten, and passing Bale at 12.43, Baden at 2.25, and Carlsruhe at 2.40, landed successfully at Frankfort at 4.40.

#### A Circular Voyage by "Adjudant Reau."

WITH Captain Renaux in command the "Adjudant Reau" left Issy on the 28th ult., carrying fourteen passengers on board and completed a circuit of 100 kilometres over Meudon, Jouy-en-Josas, the Chevreuse Valley, Boulay-les-Trous, Limours, Cernay la Ville, Versailles and Issy, the trip taking 2 hrs. 10 mins.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Annual General Meeting.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

## Committee.

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible or re-election.

The retiring members of the Committee are:—

Ernest C. Bucknall.	Sir Charles D. Rose, Bart., M.P.
Col. J. E. Capper, C.B., R.E.	A. Mortimer Singer.
G. B. Cockburn.	Hon. A. Stanley, M.P.
E. Manville.	R. W. Wallace, K.C.
J. T. C. Moore-Brabazon.	

The following members have so far been nominated:—

H. Barber.	*J. T. C. Moore-Brabazon.
Lt. B. H. Barrington-Kennett.	Norman Clark Neill.
*Ernest C. Bucknall.	A. V. Roe.
*Col. J. E. Capper, C.B., R.E.	*Sir Charles D. Rose, Bart., M.P.
*G. B. Cockburn.	Commander C. R. Samson, R.N.
Harry Delacombe.	*A. Mortimer Singer.
Capt. J. D. B. Fulton, R.F.A.	*Hon. A. Stanley, M.P.
C. G. Grunhold.	The Marquess of Tullibardine,
Major F. Lindsay Lloyd.	M.V.O., D.S.O., M.P.
*E. Manville.	*R. W. Wallace, K.C.
Fred May.	

\* The names marked with an asterisk are those of members of the present Committee.

Members are reminded that a ballot paper for the election of nine candidates to seats on the Committee of the Club will be forwarded to them at least seven days before the date of the Annual General Meeting.

## Committee Attendances during the Past Year.

EXECUTIVE COMMITTEE. Meetings held, 46.

Griffith Brewer ...	35	E. Manville ...	—
Ernest C. Bucknall ...	41	J. T. C. Moore-Brabazon ...	23
Col. J. E. Capper, C.B., R.E. ...	11	Alec Ogilvie ...	22
*G. B. Cockburn ...	15	M. O'Gorman ...	34
Capt. B. Dickson ...	11	C. F. Pollock ...	40
John Danville ...	1	Sir Chas. D. Rose, Bart., M.P. ...	16
Col. H. C. L. Holden, C.B., ...	20	A. Mortimer Singer ...	14
R.A., F.R.S. ...	20	Hon. Arthur Stanley, M.P. ...	—
Prof. A. K. Huntington ...	41	R. W. Wallace, K.C. ...	41
F. K. McClean ...	25		

\* Mr. G. B. Cockburn has attended all meetings since his election to the Committee on 21st November, 1911, viz., 15.

## ROYAL AERO CLUB FLYING GROUND, EASTCHURCH.

OWING to bad weather throughout the past week very little flying was possible at Eastchurch. Commander Samson, R.N., was out for a short time on the new Short monoplane, which flew very steadily in wind which showed 20 m.p.h. on the ground. Capt. Gerrard, R.M.L.I., was also up on the triple-propeller twin-engine biplane.

No further flying was done until Monday morning, when the

## QUESTIONS IN PARLIAMENT.

### Bomb Throwing from Aeroplanes and Airships.

In the House of Commons on the 28th ult., in reply to a question by Mr. Alden as to whether the Government had made any attempt to secure the prohibition of bomb-throwing airships or aeroplanes in time of war, Mr. Acland, Under-Secretary for Foreign Affairs, referred to the declaration signed at the last Peace Conference by the representatives of some 27 States, including Great Britain, prohibiting the discharge of projectiles and explosives from balloons or by other new methods of a similar nature for a period extending to the close of the third Peace Conference. His Majesty's Government would certainly, he said, consider the question of what

## COMPETITIONS COMMITTEE. Meetings held, 17.

F. P. Armstrong ...	4	Major F. Lindsay Lloyd ...	9
G. Brewer ...	4	J. T. C. Moore-Brabazon ...	4
Ernest C. Bucknall ...	15	Alec Ogilvie ...	9
G. B. Cockburn ...	15	M. O'Gorman ...	13
Col. H. C. L. Holden, C.B., ...	11	A. Mortimer Singer ...	1
R.A. ...	11	R. W. Wallace, K.C. ...	4
Prof. A. K. Huntington ...	10		

## FOREIGN CONFERENCES, ROME. Meetings held, 1.

R. W. Wallace, K.C. ...	1	Capt. Bertram Dickson ...	1
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## Committee Meeting.

A meeting of the Committee was held on Tuesday, the 5th March, 1912, when there were present:—Mr. R. W. Wallace, K.C., in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Capt. Bertram Dickson, Col. H. C. L. Holden, C.B., R.A., F.R.S., Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, and Harold E. Perrin, Secretary.

**New Members.**—The following new members were elected:—Frank Martin Ballard, A. J. A. Wallace Barr, Lieut. John Graham Bower, R.N., Louis Carle, L. A. Legros, Cecil Howard Pixton, John Sainsbury, and Alfred Wilson-Hughes.

**Aviators' Certificates.**—The following Aviators' Certificates were granted:—

- 189. Herbert Dennis Cutler (Short biplane, Eastchurch).
- 190. Victor Barrington-Kennett (Short biplane, Eastchurch).
- 191. Lieut. Clement Gordon Wakefield Head, R.N. (Bristol biplane, Salisbury).
- 192. Lieut. Charles Longcroft (Bristol biplane, Brooklands).
- 193. Cyril Wright Meredith (Short biplane, Eastchurch).

## Gordon-Bennett Aviation Cup.

The Royal Aero Club has sent in a challenge to the Aero Club of America to contest the Gordon-Bennett Aviation Cup, which will be competed for in Chicago in October next.

Mr. C. Grahame-White, and Mr. Hamel have expressed their willingness to represent Great Britain.

## Paper by Mr. G. de Havilland.

The Institution of Automobile Engineers will hold their sixth meeting of the session on Wednesday, March 13th, 1912, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W., when a paper by Mr. G. de Havilland, of the Aircraft Factory, Farnborough, entitled "Aeroplane Undercarriages," will be discussed.

The Institution of Automobile Engineers has kindly placed a limited number of tickets at the disposal of the Royal Aero Club, and members wishing to attend are requested to make application for tickets to the Secretary of the club.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

Territorials were out early, when a calm atmosphere lasted from 6 a.m. to 8 a.m. Sapper Meredith took advantage of this opportunity to go for his pilot's certificate, for which he qualified in an excellent manner, thus making the third Territorial to gain certificates in the last seven days. Commander Samson, R.N., and Capt. Gerrard, R.M.L.I., were also out, the former on the Short monoplane and the latter on the Naval School Machine No. 34.

instructions can properly be given to the British representatives on the subject when the time for the third Conference approaches. The next Conference, he added, would be held in 1913.

## The Government and Hydro-Aeroplanes.

In reply to a question put in the House of Commons by Mr. Joynson-Hicks, Mr. Winston Churchill, in a written reply, stated last week that one hydro-aeroplane is now under construction at Eastchurch, and two others are on order for the British Navy. Experiments with machinery of this type are being continued at Sheerness, Lake Windermere, and Barrow, and the results so far attained have been promising.



## FROM THE BRITISH FLYING GROUNDS.

### Brighton-Shoreham Aerodrome.

THREE aeroplanes have been lost as the result of the disastrous fire which broke out in the sheds on February 29th. Some employees were saying good-bye after a Leap Year ball at the Town Hall on the early morning of February 29th when they observed flames in the direction of the aerodrome. Making their way thither they found a furious fire raging and involving three of the hangars. In order to keep the fire under control a fourth hangar was pulled down. The three aeroplanes destroyed were a Nieuport and two Blériots belonging to Messrs. Chanter and Co. which were housed in two of the sheds, while the third shed, which usually housed Lieut. Lawrence's Blackburn machine, was empty. Damage is estimated at over £1,000.

### Brooklands Aerodrome.

THERE is, unfortunately, very little to report from here since Tuesday of last week, the weather conditions having made work in the air an absolute impossibility for the most part. Many of the sheds, however, have been busy in various ways—Avros and Bristols erecting new machines, Flanders making spare wings, &c. The little Hanriot is once more to be revived, under the supervision of E. V. B. Fisher, and in a couple of weeks should be seen flying again in its old distinctive style. On Wednesday evening a party of a dozen Brooklands aviators and others visited George Barnes' show at the Canterbury Music Hall, and succeeded in having a decidedly amusing time. During the week Percival has had his "oscillator" at work in the wind, providing instruction and much amusement. Certainly a very sound method of instructing pupils in the method of maintaining equilibrium, who, if able to do so on this machine, should be capable of doing the same on the most unstable aeroplane in existence.

On Thursday a test was carried out by Messrs. Martin and Handasyde regarding the strength of their plane construction, but unfortunately the trial was robbed of much of its importance by the fact that the steel clip holding the wires to the side of the shed gave way before anything else used on the machine itself. This took place when 23 cwt. of sand was distributed over the plane, which apparently would have stood a considerably heavier load. On Sunday evening there was a short period suitable for flying which Sopwith, Ducrocq and Pizey took advantage of. The latter also tested the newly erected Bristol in straight flights, finding the aileron adjustment not quite correct. On Monday morning Merriam, of the Bristol school, tested the air but found it bad. Tuesday, if anything, was worse.

### Eastbourne Aerodrome.

BAD weather has been experienced all the past week, with the exception of Wednesday, when the wind moderated somewhat. Lieut. Lawrence was out testing his Blackburn in the afternoon. He made several circuits of the ground, but the engine did not appear to be pulling at all well. He has now fitted a hand pump to the tank, as when the machine was climbing, the engine did not seem to be getting sufficient petrol, presumably owing to the tank being set rather far back. He intends leaving for Dover at the first opportunity.

### London Aerodrome, Collindale Avenue, Hendon.

**Grahame-White School.**—Owing to unfavourable climatic conditions, no work was possible last week until, during a brief spell on Sunday, Mr. Lewis Turner took out Biplane No. 2 and flew several circuits, but was forced to abandon further work owing to the wind.

**Blériot School.**—Monday morning last week, M. Pothet managed to put in two straight lines before the wind rose. After that the bad weather started, and has made all attempts at outside work at the school impossible.

**W. H. Ewen School.**—Owing to the unfavourable weather during the past week, there has been no chance for getting in any school work. The pupils, however, have been busily engaged in assisting in the constructional work going on in the hangar.

Much interest has been created by the arrival of a new 5-cyl. Viale motor.

### Salisbury Plain.

**Air Battalion.**—Wind and rain combined every day last week to render flying out of the question, so there is very little to report. Officers and men, however, were not idle, and work was in full swing in the hangars overhauling machines and tuning up engines, so that they should be in the pink of condition when the fine weather sets in.

**Bristol School.**—Very little flying has been possible on the Plain during the past week, owing to the wretched weather experienced, and the Bristol staff have had to confine their attention to instruction upon the machines in the hangars.

On Monday a terrific gale was blowing all day, thus rendering out-door work impossible.

The wind had dropped slightly Tuesday, and Jullerot was out testing conditions, also giving a couple of tuition flights, but further work was abandoned.

Wednesday was a perfect soaker.

On Thursday the previous day's rain had abated, but its place had been effectually taken by a very strong gusty wind. Several trials were made in the course of the day, but it was not considered advisable to proceed with school work.

Rain continued to fall heavily throughout Friday, and all thought of flying had to be abandoned.

Saturday saw no improvement in the weather, and yet again the staff and pupils had to confine their attention to the hangars.

Early Sunday morning Jullerot was out, afterwards taking several pupils for passenger flights, but the wind was far too tricky for any solo work.

Monday was hopeless, the wind almost approaching a gale, interspersed at times with torrential downpours, a heavy thunderstorm taking place in the afternoon.

During the past month no fewer than eight certificates have been gained at the Bristol schools, and when it is remembered that, owing to the inclemency of the weather, flying has been possible only on eleven days out of the whole month, this number is indeed creditable to both the British and Colonial Aeroplane Co., Ltd., and to their excellent staff of instructors.

Of the twelve certificates granted by the Royal Aero Club during the past month, the Bristol schools certainly have the lion's share, and, judging by the progress shown amongst the pupils still under tuition, given favourable conditions, a small crop of certificates should fall to the lot of the Bristol company in the very near future.

During the month the "Bristol" Military two-seater monoplane has furnished us with still further proofs of its stability and speed by winning the Avial Cup for a fine flight over Madrid, carried out by Mr. Harry Busteed, and also by a really fine flight made by Mr. James Valentine, who, starting up at Issy, flew over Paris, passing over the Eiffel Tower, which he circled, and then making a wide cross-country flight back to his starting point, eventually landing after having been in the air for just on an hour.

The following gained certificates during the month:—Mr. Merriam, Mr. Bendall, Capt. Weeding, Lieuts. Boer, Carfrae, W. Smith and Head.



Lieut. A. V. Barrington-Kennett qualifying for his pilot's certificate on the Short dual control biplane at the Royal Aero Club's Eastchurch flying grounds.

# MILITARY AIRSHIPS.

ON Monday evening, March 4th, the Aeronautical Society held another very successful meeting at the Royal United Service Institution, when Lieut. C. M. Waterlow, R.E., of the Air Battalion, read the following paper on military airships. Col. Sir Charles Moore Watson, K.C.M.G., was in the chair:—

Airships are rather under a cloud in this country at the present moment. Putting aside those who are working on this branch under the Government there is scarcely anyone who has a good word to say for them. The reason is not far to seek. Only eight airship pilot certificates have been issued by the Royal Aero Club, and of these all except one, are, or were, held by the Army. Most of those who have been in a position to speak authoritatively on the subject, have therefore been debarred from defending in the Press the attacks that have been made against this type of aircraft, and it has therefore been very largely a one-sided argument. I hope to bring forward, however, sufficient facts and evidence to show that airships have a very valuable part to play both on the battlefield and in civil life.

It has been generally assumed that the question of military aircraft is one of aeroplanes or airships: I submit that the proper way to regard it is, aeroplanes and airships. The Commander-in-Chief on a modern battlefield should be able to appreciate the values not only of the aeroplane and the airship, but also of the man-lifting kite and the captive balloon.

It is, of course, necessary to take account of the difficulties with which airships have to contend in order to judge of their utility; these may be classified under weather, transport, and hostile aircraft.

An airship is inherently stable and has nothing to fear from gusts. They cause pitching and tossing of a more or less severe nature, but they would seldom cause a pilot to refuse to make a flight.

Rain, snow, hail and mist increase the weight of the airship, and necessitate the sacrifice of ballast or the use of swivelling propellers. An adequate supply of ballast is, therefore, one of the essentials to successful airship navigation.

Lightning is a vexed question, some declaring that it is harmless unless the airship is directly connected with the earth, while others assert the opposite. There is, of course, a natural disinclination to make practical experiments, and thunderstorms are, in any case, best avoided.

An airship is perfectly safe so long as it is in the air, and I doubt if a vortex wind would do any real harm. It is when the airship is on the ground the danger of winds is most severe. A wind of uniform strength and direction can be coped with fairly well, but such a wind seldom exists for long. In variable winds an airship is extremely difficult to handle on the ground, and if allowed to get broadside-on disaster is almost certain.

Abroad, airships are housed in colossal sheds, and except when the wind is blowing along the axis of the shed, the airships wait indoors for fine weather. This is a very severe limitation, as a wind of only ten miles an hour blowing across the mouth of the shed prevents the exit of the craft.

Two methods of overcoming this difficulty have been attempted, one being to make the shed revolvable, and the other to shelter the exit by means of a wall. The first is expensive and impracticable for the British Army, which would be mainly concerned with overseas work. The latter is satisfactory, but cumbersome.

In the early part of 1911 the Aircraft Factory and the Air Battalion turned their very serious attention to this problem, and in the summer of that year, having noted the method of mooring the naval airship by its nose, a device was constructed by means of which airships could be anchored to a swivelling device mounted on the top of a portable steel mast. The mast is of steel lattice work, and is made in three pieces. It rests on a block of oak and is supported by four steel cables. On the top is a vertical axle, about which is mounted a hollow cone somewhat resembling an umbrella turned inside out. This is made of wood covered with canvas, and on the inside it is padded. As a whole, it is free to revolve about the mast, and in its centre is a pulley drop attached to a heavy steel cable, one end of which is held by a capstan at the foot of the mast while the other end is made fast to the nose of the airship. The strain is distributed by a system of ropes, over the whole circumference of the envelope. The attachment can be made fast and released without bringing the airship to the ground. On February 19th and 20th the army airship "Beta" was moored to this mast for 23 hours. A guard of three men was in charge, but generally only one man was on duty at a time. A rope ladder was adjusted to give access to the car, which was inspected every half hour by the sentry, whose duty was to ascertain that the gas pressure was maintained. While the airship was thus moored the weather was extremely unfavourable, rain fell during most of the night and there was almost a gale of wind about five o'clock in the morning. During the whole period

the envelope received no gas, the pressure in the balloonette was maintained by a fan operated from the ground, and discharging through 60 ft. of a 4-in. hose. This is a most important fact, because it shows that the airship is not crippled immediately if the gas supply temporarily breaks down.

The gas supply for a dirigible in the field is one of the difficulties that I classify under transport. In continental armies the equipment includes a portable shed for each airship, but our mast can be dismantled and carried on a single lorry. When reconstructed in a modified form, I believe it will be possible for a dozen men to erect it in a few hours. Also, I believe that the same number of men will be able to moor any airship up to 200,000 cubic feet to the mast. The volume of "Beta" is only 33,000 cubic feet, and that of "Gamma" 90,000 cubic feet. The average daily gas consumption of "Beta" is 466 cubic feet, or less than 2 per cent. of its volume.

In connection with the leakage of gas, osmosis has to be considered, which is the diffusion of air into the interior of the envelope, causing a loss of lift. In a period of three weeks the lift of "Gamma" decreased by 200 lbs. Gold-beater's skin, of which the envelope of "Beta" is made, offers extraordinarily high resistance to osmosis, and after a month and a-half the lift of this airship had not appreciably decreased. For a medium-sized airship, in the order of 150,000 cu. ft. capacity, I think we may expect to lose 2 per cent. (3,000 cu. ft.) per 24 hours. This quantity can be replaced by six tubes of compressed hydrogen. Each tube is 9 ft. long, and weighs about 2 cwt. They are at present transported on a wagon capable of holding nine tubes at a time, but a good motor lorry would carry fourteen tubes, or, say, 7,000 cu. ft. of gas, which would be enough to keep such an airship fully inflated for two days. Thus, we should only need two lorries for the proper attendance of an airship in the field.

The new French unit, *Escadrille* consists of eight aeroplanes and a transport of twelve motor cars, some motor tractors, a motor-driven repair wagon, and a fast motor car. This represents about two motor vehicles per aeroplane, so that the airship transport requirements do not compare unfavourably.

Other stores required by an airship are a portable ladder, repairing materials, wire and hemp cordage, leak detecting instruments, spares for the engine, and tools. The most bulky articles are the spare propellers. I think the full equipment would require two motor lorries, one for the stores and mast, the other for the gas supply. The necessary detachment men, would consist of 10 to 20, and of course they would require transport for their kit.

Before dismissing the question of gas supply and equipment, I wish to make a remark about hydrolite. Hydrolite is a chemical product composed of hydrogen and calcium; it is, in fact, a hydride of calcium.

In some ways it is similar to calcium carbide; it gives off gas when put into water, the gas, however is hydrogen. Sixty-two lbs. of hydrolite added to 62 lbs. of water will produce 1,000 cubic ft. of hydrogen, which has a lifting capacity of 70 lbs. The product of the chemical process is 100 lbs. of calcium hydrate. Thus, such an equipment on an airship would increase the lift and at the same time retain most of the ballast; unfortunately, 1,000 feet of gas thus produced costs, at present, about £4.

The next point I shall discuss is the hostile attack of an aeroplane. Generally the argument is that the airship's tactics will simply consist of running away or seeking security at a greater height. I think no airship should go on service without a weapon, such as for instance, a gun capable of discharging a  $\frac{1}{2}$  or  $\frac{3}{4}$  lb. shrapnel shell with an automatic fuse setter in the breech. The setting of the fuse would be altered by the sights, the loading would be automatic, and every fifth or sixth shot might be a tracer shell, leaving a smoke trail to assist in making rapid corrections.

The aeroplane has three vital parts—its crew, its engine and its propeller. The latter for artillery purposes, is a disc of from 6 to 8 ft. in diameter, and cannot be protected by armour plate. I think that a propeller would be immediately shattered if struck by a fragment of shell, and in all probability this would put the aeroplane out of action.

The aeroplane can attack in three ways, (1) by getting above the airship and dropping something on to it, (2) by firing at the airship from the same level, (3) by ramming.

The airship will open fire on the aeroplane as soon as it is within range, and will probably manoeuvre broadside-on to the aeroplane for this purpose. As the distance decreases the airship would make full speed ahead to clear the aeroplane's track. If the aeroplane opens fire with a rifle, the airship would manoeuvre end on, and as the distance decreases would make a vertical ascent, which can be done very quickly. Personally, I think that such a fight would by no means be so much in favour of the aeroplane as some critics have made out. The airship has superior manoeuvring power in



every plane, it can carry a superior offensive weapon, and it has the immensely important advantage of being able to stand still while using it.

In a combat between airship and airship, superior marksmanship and navigation would necessarily be determining factors. Personally, I think the correct tactics would be to run away, if it can be done with the wind, or in any direction that will expose the enemy to artillery fire from the ground. It is, moreover, practically the only manoeuvre that avoids the liability of exposing your own craft broadside.

There is also the question of airship *versus* artillery, and having seen much artillery practice at various kinds of aerial targets during the last six years, I have come to the conclusion that air-craft travelling below 1,000 ft. elevation run a most serious risk of being disabled by ordinary field guns and howitzers, such as are possessed by every army. At an elevation of 4,000 ft., I think an airship is reasonably safe if the speed over the ground is at least 15 miles per hour. Ascent and full speed with the wind would be the safest tactics to pursue in order to avoid such fire.

But, it is important to remember that the proper rôle of the airship is defensive and not offensive where hostile aeroplanes are concerned. The airship must be able to protect itself, and this, I consider, puts out of court the small airship of less than 100,000 cubic feet, since nothing short of that size could carry a suitable weapon and ammunition, and, at the same time, possess sufficient speed to withstand ordinary weather conditions.

The control of an airship is a subject of considerable interest, which I will review by mentioning some features of its evolution at Farnborough. On "Nulli Secundus" the balanced rudder was abandoned, only to be brought into favour again quite recently. The boat-shaped car for the crew was likewise abandoned, and has similarly been re-introduced. The need for a fixed horizontal or vertical plane soon became apparent. On dirigible No. 2 an elevator was situated in the bows, and was found to be much too powerful. There was a fixed horizontal plane aft. In 1909 the airship "Baby" was built, and subsequently converted into the "Beta," which is now three years old, and as good as ever, a record which has not been beaten in any other country. Originally it had three fins on the tail of the envelope, which were found to be too unwieldy for practical work. The uppermost vertical fin was first removed and replaced by a triangular sail, which was found to have a tendency to pocket the wind, and also to lack rigidity. At present there are three fixed planes, two horizontal and one vertical. There is also an unbalanced rudder and two small planes in the bow. "Gamma" was the next airship that was built; it had balancers on the tail, also elevating planes both front and rear, all of which have since been abolished. A box kite arrangement was fitted to the stern end of the frame, and is if anything too powerful. The most important point about "Gamma" is the swivelling propellers, which are so arranged that they can be turned so as to push the airship up in the air or pull it down. It is an invaluable device, and I regard it as an essential feature on a military airship.

The crew of an airship should, I think, consist of a pilot, steersman, engineer, wireless operator, gunner and observer. The pilot

is the captain of the ship, and is responsible for the course, the elevation, and the maintenance of the pressure in the envelope. Wireless can be worked on board an airship successfully, but signals cannot be heard without stopping the engine, which however is not necessary for sending information. Code messages are, I think, essential, and some simple coding apparatus would be most desirable.

Among the functions of a military airship I place reconnaissance first and foremost. Aeroplanes are suited to obtain general information, but for collecting complete and exact details I think an airship is invaluable. If the information is transmitted by wireless the airship might also prove more expeditious in its work than an aeroplane.

Bomb dropping is another important branch of its work, and this is a business that requires the entire attention of one man. I do not think that the observation of gun fire is practicable from an airship, as after six years' practice at it from captive balloons and kites, I feel that the difficulty of transmitting observation sufficiently quickly to be of use quite puts this work out of court. Telephonic communication is necessary for the purpose, and there is endless confusion and trouble when the telephone breaks down, as it so often does. In night work, the airship practically has the field to itself and should be able to do much useful work, particularly by stopping the engines and listening for sounds that might betray the movements of troops or supply columns.

To conclude, I will give a brief outline of my personal idea of an ideal military airship. Its size, I think, should lie between 150,000 and 200,000 cu. ft. The Lebaudy which came to England was 350,000 cu. ft. capacity, and the Clement-Bayard 250,000 cu. ft. The "Beta" is only 33,000 cu. ft., and the "Gamma" 95,000 cu. ft.

With hydrogen giving a lift of 70 lbs. per 1,000 cu. ft., the ideal military airship would be able to raise 10,500 lbs. This I should apportion as follows: car, frame, envelope, &c., 4,000 lbs.; four engines of 100 h.p., 1,600 lbs.; crew of seven, 1,050 lbs.; the gun, 300 lbs.; 650 rounds of ammunition, 500 lbs.; wireless, 500 lbs.; hydrolite, 500 lbs.; fuel and oil, 1,000 lbs.; ballast, 1,040 lbs.

The speed should not be less than 45 m.p.h., which ought to be possible with 400 h.p. An altitude of 8,000 ft. should also be possible. The airship should be constructed on the semi-rigid principle, with a long girder close to the envelope; by this means alone can head-resistance be minimised. The car would be in the form of a narrow boat, and 20 or 30 ft. in length, and about 4 or 5 ft. broad in the bow. Fuel and ballast would be carried below the deck level, also the hydrolite and ammunition. I would suggest the use of a vertical hole and rope ladder to give access to the top of the envelope for a look-out.

The envelope would have two ripping panels, and a valve on top, in addition to the usual automatic valves on the lower side. The control levers and pedals I should arrange as on a motor car, so that everything is within reach of the steersman.

Those who discussed this paper at the meeting, and others who desire to comment thereon, are invited to embody their remarks in letters to the Editor.

## ✠ ✠ WORLD'S RECORDS.

### Vedrine Improves on His Speed Records.

NOT satisfied by the speed attained in his record-breaking flight on the 22nd ult., Vedrine set to work to try and tune up his Deperdussin machine still further, and at Pau, on the 28th ult., he was unofficially timed to cover 10 kilometres at a speed of 167.250 k.p.h. On the following day he started off on another trial, but had to come down after 50 kilometres. His best speed then was 162 k.p.h. On the 1st inst., he made another trial and this time got up to 166.821 kilometres an hour. He only continued flying for a couple of minutes beyond the hour, but by that time he had covered 170 kilometres. The new records, as well as the old ones, are shown in the following table, and his time for 170 kilometres was 1 hr. 1 min. 55 secs.

	New records.		Old records.	
10 kiloms.	...	3 mins. 35½ secs.	...	3 mins. 43½ secs.
20 "	...	7 " 14 "	...	7 " 27 "
30 "	...	10 " 53½ "	...	11 " 10½ "
40 "	...	14 " 32½ "	...	14 " 54½ "
50 "	...	18 " 10½ "	...	18 " 38½ "
100 "	...	36 " 23½ "	...	37 " 22½ "
150 "	...	54 " 35½ "	...	56 " 17 "
½ hour.	...	40'374 kiloms.	...	39'303 kiloms.
⅓ "	...	80'374 "	...	79'303 "
1 "	...	164'431 "	...	159'303 "

The greatest speed record only stood for twenty-four hours as on the next day he was at work again and was officially timed to cover 10 kiloms. in 3 mins. 34½ sec. at a speed equal to 167.910 kiloms. an hour, (over 104 miles an hour).

### Tabuteau Gets Two Records.

TABUTEAU is, like Vedrine, persistently working at Pau and improving the speed qualities of his Morane monoplane, and while Vedrine was revising his figures for the speed records up to 150 kiloms., Tabuteau started off and made a two hours' flight securing the record for that time and also for a distance of 250 kiloms. The first 60 kiloms. were completed in 25 mins. 39 secs., 100 in 51 mins. 7½ secs., 150 in 1h. 16m. 32s., and 200 in 1h. 42m. 17½s. In the first hour it covered 115'231 kiloms., while in 2 hours he more than doubled this distance, covering 234'431 kiloms. He went on till he had covered 250 kiloms. in 2h. 7m. 54s., and then came down. The new and also the old records are shown in the following table:—

	New record.		Old record.	
2 hours	...	234'431 kiloms.	...	227'454 kiloms.
250 kiloms.	...	2h. 7m. 54½s.	...	2h. 22m. 57½s.



### The Balloon Distance Record.

AFTER conferring with the Kieff Aeronautic Society the Aero Club of France has decided to accept the distance of 1,953 kiloms. 898 metres as the distance of M. Emile Dubonnet's balloon voyage from Lazmotte-Bruille to Sokolowska, made on January 7th and 8th last. This is a world's record for distance, and it won for M. Dubonnet the Lahm Cup, while the Aero Club of France has also decided to give M. Dubonnet a gold medal.

# AIR EDDIES.

I NOTICE that the Rhyl Ratepayers' Association, recognising the advertisement that is being afforded to the town by Mr. Vivian Hewitt's splendid flights in the neighbourhood, has decided to organise a dinner in honour of that well-known pilot. It is good to see lay appreciation taking practical form.

Earle L. Ovington, the American pilot of the Blériot monoplane, who qualified at Pau, and who during the past season has met with great success in exhibition work, and at the meetings he has attended in America, has decided to permanently give up exhibition flying, in order to devote himself more fully to the production of a new monoplane which he hopes to have ready by the commencement of the season.

The Grahame-White Aviation Co., Ltd., apparently not completely satisfied with their magnificent office equipment at Hendon, have opened a branch office in the heart of the West End, at 166, Piccadilly. Expansion is a sign of the times these days, thanks to Government encouragement.

Mr. James Valentine, one of the most popular English aviators with Continental folk, has been doing much in Paris to popularise that excellent monoplane turned out by the Bristol Co. It will be remembered that at the time of the Paris Show his flight over that city gave rise to much favourable comment, and caused the Bristol stand to be one of the chief centres of interest of the Show. On Wednesday of last week Paris was given a further demonstration of its qualities, Valentine, starting from Issy, and, in spite of the none too comfortable wind, flying over the Eiffel Tower, and, making a wide detour, returning to that famous parade ground after an hour's aunt.

A feat hitherto unattempted in the annals of aviation, the dropping from an aeroplane in flight by means of a parachute, has at last been accomplished. The participants in this remarkable experiment were Antony Jannus, who flies a Benoist biplane, and "Captain" Elbert Berry, a parachute jumper. An altitude of 1,500 ft. was reached before Berry let himself down from his seat, and trusted his life to the parachute packed away in a special case beneath the main planes. Reports testify that he dropped quite 400 ft. before the parachute opened and retarded his descent. The experiment took place at St. Louis on Saturday last. In a feat of this kind it is rather open to doubt as to whether the pilot or the parachute jumper is running the greater risk. In our opinion we should be inclined to attach the greater courage to the aviator, for, although Grahame-White at the Hendon military demonstration showed that it was possible to drop weights up to 100 lbs. without any adverse effect on the flying of the machine, yet the risk of the parachute not

becoming freely detached from the machine, or of its becoming entangled in some vital part, is considerable. The newspaper that included in its report the assertion that a Berry dropped from the machine, the aeroplane, released of his weight, bounded upwards like a cork, seems to have more imagination than actual knowledge of the principle on which heavier-than-air machines operate.

Mr. B. C. Hucks, who has earned for himself and the Blackburn monoplane considerable popularity for his excellent handling of that machine, has returned to Filey the scene of his original experiences, where he intends to resume operations. Rumours are current that he has prepared designs for a passenger carrying monoplane to compete in the forthcoming Military tests.

On Thursday of last week, the 29th ult., a meeting was held at the Richelieu Palace Hotel, Oxford Street, W., in connection with the Women's Aerial League. The President, Gen. Arbuthnot, C.B., R.A., spoke to the effect that although France was considerably in advance in her appreciation of the importance of the "fourth arm," yet, in his opinion, the time would not be long in coming when, in this department of defence, England would supersede her Continental rivals. Having just returned from a long stay in Germany, Lady Eleanor Shelley testified to the advance of aviation in that country, and deplored the unsatisfactory state of affairs in England. Mr. S. F. Cody, however, scarcely agreed with this, and in a way he is justified in doing so, for has he not a biplane which, on the score of efficiency, speed, climbing and lifting capabilities, would compare favourably with any foreign aeroplane. Further, he expressed the belief that the time would arrive when alighting platforms for aviators would be erected over houses in London.

Captain Patrick Hamilton, who will be remembered as having done much flying in company with Mr. G. Dyott, on Deperdussin monoplanes in America, is now in New York preparatory to returning to this country. His stay here, however, is not likely to be a long one, for he has intentions of proceeding to India.

Illustrative of the difference of meaning one small word can effect in a sentence, is the inscription that appeared last week under the photograph depicting the landing chassis of the new Hanriot-Pagny monoplane. By a slight slip on the part of the compositor the phrase "modelled on pronounced Nieuport lines" was made to refer to the chassis in question, instead of to the machine itself. As a matter of fact the landing gear is really the only section of the machine that differs a great deal from contemporary Nieuport practice.

"OISEAU BLEU."

## U.S. Buying Army Aeroplanes.

FIVE Wright biplanes have just been ordered by the U.S. Army authorities, and will be delivered during May and June. Three of the machines will be specially built at the Wright Bros. factory for Military use, and equipped with 50-h.p. 6-cylinder Wright engines. Another machine from the Wright Bros. factory will be specially built for speed, and will have to do over 65 miles an hour. The fifth machine will be a Burgess-Wright, fitted with a 60-h.p. 6-cylinder motor, and capable of going over 50 miles an hour. Brig.-General Allen, Chief Officer of the Signal Corps, states that more machines will be purchased shortly, and it is probable the number owned by the U.S. Army will be brought up to fifteen before June 30th.

## U.S. Government and Aeroplanes.

WITH reference to the above, it is instructive to note the following official specifications:—

1. It must carry two persons with the seats so arranged as to permit of the largest possible field of observation for both.
2. The control must be capable of use by either operator from either seat.
3. The machine must be able to ascend at a minimum rate of 2,000 ft. in 10 minutes while carrying a weight of 450 pounds, and the amount of fuel stated in paragraph 4.
4. The fuel supply must be sufficient for at least four hours of continuous flight.
5. It must be easily transportable by road, rail, &c., and easily and rapidly assembled and adjusted.
6. The starting and landing devices must be part of the machine itself, and it must be able to start without outside assistance.

✱ ✱

7. The engine must be capable of throttling to run at a reduced speed.

8. The engine will be subject to an endurance test in the air of two (2) hours continuous flight.

9. The aeroplane must develop a speed in the air of at least forty-five miles an hour.

10. The machine must be capable of landing on and arising from ploughed fields.

11. The supporting surfaces must be of sufficient area to insure a safe gliding angle in case the engine stops. This will be determined by a test during calm atmospheric conditions. At an altitude of 1,000 ft. the engine will be entirely cut off and a glide made to the ground. The horizontal distance between position of cut-off and landing must be at least 6,000 ft., or at other altitude of the same ratio.

*Note.*—In case the weight carrying capacity is increased to 600 pounds, the minimum speed may be reduced to thirty-eight miles per hour, and the climbing power diminished to 1,600 ft. in 10 minutes.

It will be observed that the machines have to be capable of being controlled by either of the officers carried, and this is a point which is also insisted upon by the Naval authorities, who, however, incline to the Curtiss type of machine.

## Log Books for Aviators.

THE United States Navy has now instructed their aviators to keep regular log books in connection with each aeroplane. These books, which will be in duplicate, one being filed in the archives of the Navy Department, and will contain a record of the weather conditions, the flights made, if any, on a particular day, and any special information that may be available.



# FOREIGN AVIATION NEWS.

## Paulhan Wins the Aspremont Cup.

AT Nice on the 1st inst., Paulhan succeeded in fulfilling the conditions stipulated and won the Aspremont Cup. He rose from the surface of the sea at Juan-les-Pins on the Curtiss hydro-aeroplane and flew to the California Aerodrome, where he landed after covering the 25 kiloms. in 15 minutes. Starting up again from the aerodrome he passed down in front of the Palais de la Jetee on to the surface of the sea and then rising again flew back to the California ground. An hour later he rose once more and returned to his headquarters at Juan-les-Pins.

## Paulhan to Fly the Channel.

IN view of the success which he has obtained with the Curtiss hydro-aeroplane at Nice, it is reported that Louis Paulhan intends shortly to make an attempt to fly on one of these craft across the English Channel from Calais to Dover.

## Vedrine and the South Pole.

AS the result of a chance meeting in the train it is stated Vedrine has offered to accompany Dr. Jean Charcot in an Antarctic expedition and endeavour to reach the South Pole by aeroplane. When the time comes—well, we will wait and see.

## French Navy and Aeroplanes.

UNTIL the new aerodrome, which is now being prepared at Frejus, is ready, the French Naval Aviation Corps will have their headquarters at Montpellier. Provision is made in the supplementary naval estimates for the purchase of ten machines, in addition to the two, a Farman and a Voisin, which have already been obtained.

## Visiting by Aeroplane.

DURING a visit of inspection at Pau, on the 27th February, Col. Hirschauer was carried for a round of visits to the various aerodromes in the district by Leblanc on his Blériot, while Col. Bouttieaux was taken round at the same time by Perrayon. Col. Hirschauer, on the following day, made a similar trip under Leblanc's pilotage.

## Simon showing them how.

DURING last week, visitors to the Blériot school at Pau saw some highly spectacular flying, when Simon gave a demonstration of some of the trick flying which he had learnt during his tours in the United States.

## Typewriting in the Air.

A NOVEL experiment was tried at Pau on the 1st inst., when a typewriting machine was placed in one of the latest two-seater Blériot monoplanes, and when at a height of 500 metres the passenger typed his impressions. What vistas this departure opens up for future business generations!

## Long Flights at the Blériot Schools.

AT Pau on Sunday Lieut. Brule on his Blériot put in his second trial for his superior *brevet*, at a height of 1,500 metres, over a course

from Pau to Magescq and back, a distance of 160 kiloms. On the 27th ult., Lieut. Bernis was flying for two hours and Lieut. Willermoz was up for an hour, feats which were repeated by both officers on the following day. Lieut. Massol flew to Aire-sur-Adour and back and also to Lourdes, Tarbes and back. At Etampes on the 27th ult., Baron Pasquier made the first test for a superior certificate. On the 1st inst. at Pau, Cavalry-Sergeant Feierstein was flying for two hours.

## High Flying at Caudron School.

ON his Caudron biplane, at Crotoy, on the 28th ult., Lieut. Peralda was flying for over an hour, and several times rose to a height of over 1,600 metres.

## A Quartet of Deperdussins for Morocco.

AT Issy, on the 28th ult., Prevost was testing four Deperdussin monoplanes which are to be used at the French military aviation centre which is being organised in Morocco. He also gave a trial to the two-seater monoplane shown at the last Salon. With a passenger, and sufficient petrol for three hours, he ascended 600 metres in 4 mins. 18 secs.

## New Farman Superior Pilots.

ON the 27th ult., over the Rheims-Vitry course, Naval Lieut. Fournie passed the third test for his French superior *brevet*, and Lieut. Pierra made his second qualifying flight. Both officers used Farman biplanes, and the latter's time for the 150 kiloms. was 1 hr. 48 mins. On the same day Lieut. de Marnies made his second flight over a course from Buc to Bourneval and back, using a M. Farman biplane. Lieut. Pierra made his third test flight on the 28th ult.

## Activity at Maurice Farman School.

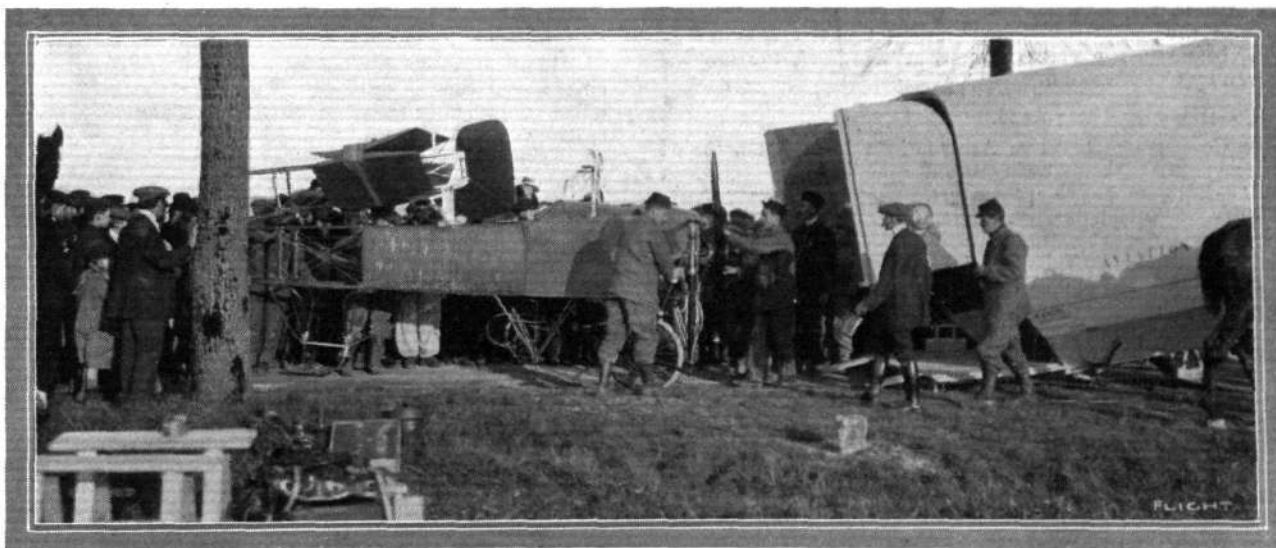
ON Sunday a lot of cross-country flying was put in by the officers at the Maurice Farman School at Buc. Lieuts. Nicaud and Noe, accompanied by Lieuts. Vitra, Bordage and Reynaud made reconnaissances in the direction of Juvisy, and Lieuts. Cheutin, Battini and Varcin flew over to St. Cyr at a height of 1,500 metres. Lieut. Cayla made a cross-country flight round Buc, while Fourny was demonstrating a new military machine in the presence of Capt. Destouches. On the 27th ult., Capt. Bares took Lieut. Vitra for a long trip along the Seine Valley, while Lieuts. Nicaud and Noe flew over to Villacoublay. The same day Lieut. Mauger-Devarenne was flying for a couple of hours over Versailles, St. Cyr, &c.

## Good Progress by Greek Officer.

LIEUT. KAMBEROS, an artillery officer in the Greek Army, has shown splendid aptitude as a pilot aviator after a course of instruction at the Farman school at Etampes. On the 27th ult. he was flying for an hour and a quarter at a height of 200 metres, and made a cross-country flight in the direction of Angerville.

## More Berel Monoplanes for French Army.

CAPT. DESTOUCHES visited La Vidamée on the 27th ult. in order to witness the official tests with a trio of Berel monoplanes



A military aeroplane dismantled ready for transportation in the special aviation wagon which has been constructed for military manoeuvres in France. This wagon, immediately the aeroplane is safely housed, is in a few minutes attached to a fore-carriage, and is then ready to be hauled anywhere by the horses.

before they were taken over by the French Army. In the hands of Verrept they easily complied with the stipulated conditions, mounting 300 metres in 3 mins. 35 secs., and carrying a useful load of 180 kilograms.

## Doings at Sommer School.

TESTING a Sommer military monoplane, on the 27th ult., at Mourmelon, Bathiat rose 300 metres in 2 mins. 35 secs., and Lieut. Bosquet, on the following day, after flying a similar machine for an hour, spent some time testing a new small biplane. On Sunday, at the request of some officers, Bathiat glided, with the motor stopped, from a height of 50 metres, and landed in a circle of 8 metres radius.

## Long Flight by Train.

BEFORE a military commission on the 28th ult., at Villacoublay, Train was flying for a couple of hours on a military monoplane, the seventh he had delivered during the month to the French Army. At Mourmelon on Sunday, Cure and Percival on a two-seated Train monoplane made a 45-minute flight.

## Marcel Hanriot after Superior Certificate.

ON the 28th ult. Marcel Hanriot made his first qualifying flight for a French superior certificate, and using a 50-h.p. Hanriot monoplane, completed the course from Rheims to Vitry and back in 1 hr. 23 mins., his speed being 110 kiloms. an hour, while his altitude averaged 1,200 metres. A similar flight was made on the 1st inst.

## Good Tests by Gordon Bell.

AT the R.E.P. school, on Sunday, Gordon Bell was flying for half an hour on one of the European circuit-type monoplanes, and afterwards was up, accompanied by two passengers, for 45 mins. on a machine fitted with one of the new 7-cylinder 90-h.p. motors, the altitude being well over 1,000 metres.

## Ch. Nieuport Up for 1 hour 45 minutes.

AMONG several good flights made by Charles Nieuport at Pau lately may be noted one on Sunday last of an hour and three-quarters' duration. He was using a Nieuport monoplane fitted with a Nieuport motor.

## 2½-Hour Trip by Lieut. Gaubert.

MANY lengthy cross-country trips have been made from the Betheny grounds recently by Lieuts. Magnin and Gaubert on their Borel monoplanes, but one of the best so far was that of the latter on Sunday evening, when he was flying for two hours and a-half without landing.

## Lengthy Practice at Deperdussin School.

UNDER the guidance of Bielovucie, the pupils at the Deperdussin school at Betheny have been putting in some long practice flights recently. On Sunday Lieuts. Dietrich and de Chabot each flew for an hour, and Lieut. Schlumberger flew over to Mourmelon and back at a height of 1,500 metres.

## Honour for a Farman Pilot.

FOURNY, who is *chef pilote* at the Farman School at Buc, and is a corporal in the Reserve, was decorated with the Cross of a Chevalier of the Legion of Honour during the afternoon of the 28th ult., before the assembled troops at Versailles, the *accolade* being given by Col. Cauboin.

## Records Officially Recognised.

THE Commission Sportive Aeronautique have just accorded official recognition to the following records:—

*Height.*—Pilot and two passengers, Verrept, January 20th, La Vidamée, 1,000 metres. Prevost, January 28th, Betheny, 2,000 metres.

*Speed.*—Closed circuit, Tabuteau, January 24th, Pau, 200 kiloms. in 1 h. 54 m. 17 s.; 250 kiloms. in 2 h. 22 m. 57½ s.; 300 kiloms. in 2 h. 51 m. 43½ s.

*Time.*—Tabuteau, January 24th, at Pau, 2 hrs., 205·287 kiloms.; 3 hrs., 310·281 kiloms.

*Duration.*—Closed circuit, pilot and five passengers, Molla, January 16th, Douzy, 1 h. 6 m. 48½ s.

## The National Movement in France.

SEVERAL more substantial donations have been received towards the National Fund for providing the French Army with aeroplanes, and on the 2nd inst. the total stood at over 700,000 francs.

## Five Farmans Flying in Company.

DURING a visit to Buc on the 2nd inst., Col. Hirschauer saw Fourny, Lieuts. Battini, Varcin, and Noe and Capt. Bares, each on

Maurice Farman machines, leave for Mailly Camp where they are to carry out experiments demonstrating the use of aeroplanes from an artillery point of view. On the way the aviators stopped at Nangis in order to deposit wreaths on the tomb of Captain Camine.

## A Stormy Trip.

IN the face of very adverse conditions, Lieut. Sylvestre, on a Blériot monoplane, on Monday flew from Etampes to Chalons, covering the 175 kiloms. in 1 hour 25 mins., the wind being behind. On the return journey he had to fight his way against the wind, and was much troubled in the neighbourhood of Montereau and Provins by the wind. He, however, got back safely to Etampes, and was warmly congratulated by Capt. Felix.

## From Rheims to St. Cyr on a Farman.

HAVING completed the tests for his superior military certificate Lieut. Pierra left Rheims on his Henry Farman biplane on Monday and flew over to St. Cyr. He made a stop on the way at Ferteisous-Jourarre where he picked up seven carrier pigeons which were released at the end of the journey.

## A Military Aerodrome at Poitiers.

ON Saturday last Lieuts. Le Bleu, Sylvestre, Bellemois, and Boucher arrived at Poitiers, and at once proceeded to get ready for inaugurating a military aviation centre there. It is hoped flying will commence next Saturday.

## A Triple Certificated Pilot.

IT is very rarely that one man secures all three pilot certificates, aeroplane, dirigible, and balloon, issued under the F.A.I. regulations, and in fact until the other day, France only boasted two, M. Santos Dumont and Capt. Eteve. They have now been joined by a third, Maurice Herbster, who obtained a dirigible pilot's certificate on Monday.

## A Two Hours' Flight at Amberieu.

DURING a flight which lasted a couple of hours on Monday, Vidart on his Deperdussin monoplane, was flying over Amberieu, Jujurieux, Pont d'Ain, Neuville-sur-Ain, the Ain Valley, the Bramafan Hills (which he crossed at a height of 2,000 metres), Lagnieu, Ambutrix and Vaux.

## Ninety-Nine Entries for the Peugeot Prize.

A FURTHER eight entries received during the week for the Peugeot prize for a ten-metre human flight brings the total up to ninety-nine. Among the latest entries may be noted the name of Ladougue, well known as a Goupy pilot, while another is a lady, Mdle. Juliette Cure.

## Switzerland Taking Up Military Aviation.

THE Swiss Military authorities have decided to start an aviation centre at Fraenfeld, and have also asked the Swiss Aero Club to report as to the best means of encouraging aviation, as Swiss pilots all seem to seek their fortunes outside their own country. Durafour, Wyss and Audemars, all have gone to America, leaving Maurice Blanc and Rene Grandjean to represent aviation in Switzerland.

## A Nieuport in Greece.

HAVING returned to his native country, Argyropoulos gave the citizens of Athens an exhibition of flying on the 2nd inst. He made a fine cross-country flight on his 60-h.p. Nieuport monoplane, and at its conclusion was congratulated by the King and other members of the Royal Family, who had followed the aeroplane in a motor car.

## An American Pianist Learning to Fly.

MISS ELEANOR SPENCER, a young, well-known American pianist, has a great ambition to become an aviatress, and with that end in view, in company with a friend, Princess Schakowski, is now taking lessons at Johannisthal.

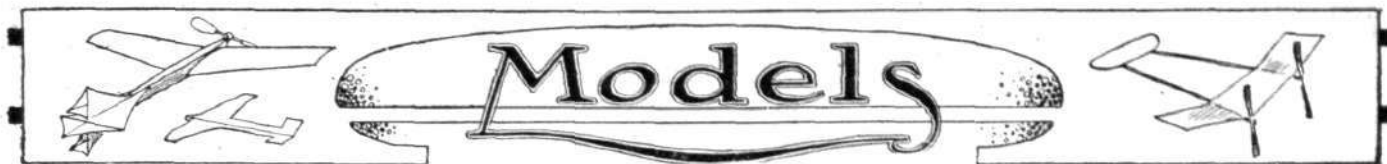
## New Aerodrome in Westphalia.

A COMPANY with a capital of 1,100,000 marks has just been formed with the object of taking over a flying ground at Neuenbausen, close by Gelsenkirchen. A large dirigible garage is also to be erected, under the promise from the Minister of War of an annual subvention of 15,000 marks.

## The Gordon-Bennett Balloon Race.

FROM Berlin it is announced that Germany, Great Britain, France, Belgium, Switzerland and the United States have each entered three balloons and Russia one balloon for the Gordon-Bennett balloon race, which will start this year in Germany.





Conducted by V. E. JOHNSON, M.A.

**Scale Models.**

We herewith give the remainder of Mr. Ernest A. Vessey's communication on this subject:—

"Provided that the argument set out in last week's issue is correct, the larger model may be successfully constructed to fill all conditions, provided gold-beater's skin is used to cover the planes, any difference in finished weight being made up by a compensating weight placed within the wing structure and with its centre of gravity coincident with the C.G. of the completed supporting surface. Supposing now that we wished to construct the smaller model recommended by Mr. Lanchester (two models being suggested, viz.,  $\frac{1}{4}$  and  $\frac{1}{16}$  full size), it is at once apparent that the only course open is to modify the internal structure of the planes so as to compensate for the increased relation weight of the fabric. Theoretically this causes no serious difficulty, but in practice the question of strength and rigidity immediately becomes prominent, and the adjustment between the latter factors and the weight form a problem not easy of solution even by a process of trial and error.

"For the sake of argument, let us suppose that the fabric used in the model is sufficiently strong and rigid to allow of planes built of it alone without any internal spars or framework whatever. Let us select mica, as used in the Lanchester gliders, for our fabric. This is about one-thousandth of an inch thick, and weighs approximately  $\frac{1}{4}$  oz. per sq. ft.

Let  $A$  = the total skin friction area of the full-size plane.

$L$  = the scale of the model in terms of full-size.

$W$  = the total weight of the completed full-size plane.

Then if  $A$  is in sq. ft. and  $W$  in lbs. the total model area =  $AL^2$  sq. ft.

And if mica, as above, is used for the model plane the total weight =  $\frac{AL^2}{4}$  ozs. (2)

But by the rule (see last week's issue) the total weight of the model plane must not exceed  $WL^3$  lbs. =  $16WL^3$  ozs. (3)

In the limit the expressions (2) and (3) must be equal, i.e.,

$$16WL^3 = \frac{AL^2}{4},$$

whence  $L = \frac{A}{64W}$  (4)

by substituting known values for  $A$  and  $W$  the minimum scale allowed by this method of construction may be found. I have, unfortunately, not been able to obtain reliable values of  $W$ , but no doubt some reader of FLIGHT can supply them. It will be sufficient, however, for the present purpose to find the value of  $W$  (total weight of the full-sized aerofoil), which permits of a  $\frac{1}{16}$  scale model being built on these lines; assuming that the supporting surface is 200 sq. ft., whence  $A$  is 400 sq. ft., substituting these values in equation (4) we have  $\frac{1}{16} = \frac{400}{64W}$ , whence  $W = 100$  lbs.,

which is, without doubt, considerably in excess of the weight permissible in a machine of this size. Assuming, however, that this value of  $W$  agrees with practice; let us consider the strength of a model aerofoil constructed of mica in the manner described; the scale of the model being  $\frac{1}{16}$  full size. The span of the full-sized

counterpart would probably be about 32 ft., whence the model span is 2 ft. Could such an aerofoil be constructed in the manner described, to be of sufficient mechanical strength to support the model in flight, apart altogether from the consideration of the effect of landing shocks and collisions? Obviously, no. We, therefore, arrive at the following conclusions. That if a model is to be built, which in flight will reproduce the performance of its full-size counterpart as regards everything except speed, the smallest permissible scale is  $\frac{1}{16}$  [ $\frac{1}{8}$  to  $\frac{1}{4}$ , V.E.J.] full size, and that in such a model the best wing construction is a framework true to scale and following exactly in every detail that of the full-size machine.

This appears to me to be a rather unexpected result, and one which will bear discussion.

**Inter-Club Contests.**

A suggestion has been made to us which, we must say, appears to be an excellent one if it can be successfully carried out, and there certainly seems no valid reason why it should not. It is that there should be this season a series of model club flying contests in very much the same way that we have annually cricket and football matches between, we suppose,—reckoning both large and small—some thousands of different teams. True, there are not at present thousands of model aeroplane clubs in existence—there are quite a respectable number, however; fully thirty at least, which are capable of putting a good team in the field; quite a large enough number to commence with. Provincial footballers and cricketers think nothing of running up to Town from Birmingham, Manchester, Sheffield, Liverpool, Bristol, &c., and even Edinburgh and Glasgow; or Londoners of travelling so far afield as the above-mentioned places; then why not aeromodelists? According to the accounts which appear in our club notices, we have some decidedly "crack" flyers in the provinces, and it would be intensely interesting to see if they could or could not hold their own against some of the best London clubs.

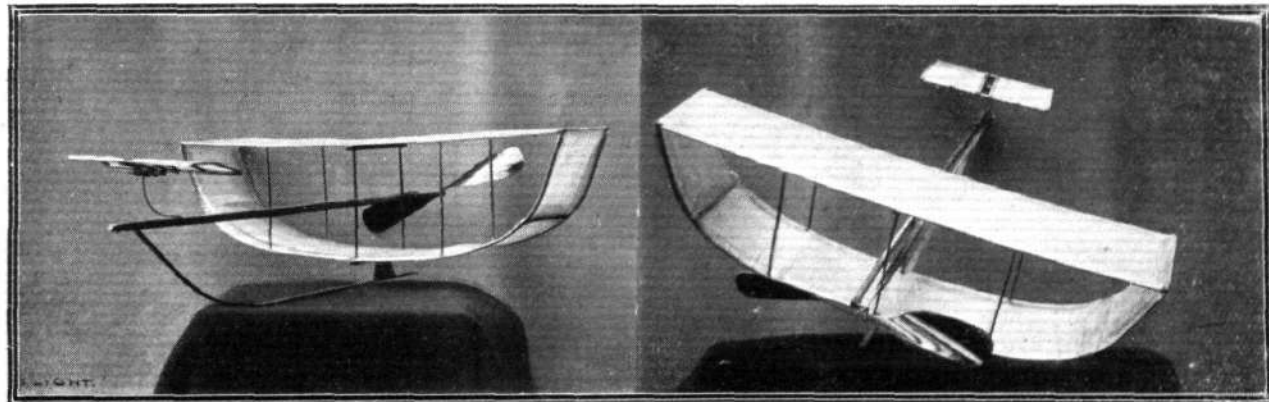
There is no question of prizes. A cricket team doesn't go from Yorkshire to play a team in Surrey for a prize—but for the love of the game and the honour of winning.

There might, of course, be a cup, or something of that kind, for the winner of the most inter-club contests at the end of the season.

Will the secretaries of the London and also of the leading provincial clubs kindly communicate their views to us on this matter; and if we can do anything to further such a scheme we shall only be too happy to do so.

**The Bragg-Smith Model Biplane.**

We publish this week two illustrations of the simplest form of this celebrated model—a form in every way suitable for the novice in model aeroplaning. The total weight of the model we found on weighing to be exactly 95 grammes, and the weight of rubber only 12 grammes, which in itself is a proof of its efficiency. Although the model is lightly built, it is extremely strong, and can be flown time after time without breakage, a fact which should appeal strongly to the beginner. The average length of flight, in the case of this particular model, is stated by Mr. Bragg-Smith to be about 100 yards, which is certainly not an over-estimation, and quite sufficient to commence with. We have been given to understand from vendors



Two views of Bragg-Smith's model biplane.

of this model that they have never had a complaint from purchasers, and we can well believe it to be true. It is not what one would call a *cheap* model; but when did cheapness and efficiency ever go hand in hand? And yet so curious is human nature that we have personally seen at a certain emporium, which shall be nameless, a customer deliberately buy one of those cheap, abominable French toys, called models (which did their level best in 1910 to choke every purchaser off model aeroplaning), in preference to one of this character.

In model competitions generally last season the monoplane, figuratively speaking, swept the board; but then it was far more in evidence—far more *fashionable*; in spite of it all, however, Mr. Bragg-Smith has valiantly stuck to his guns—and the monotonous monoplane was not always victorious; with self-rising and hydro-aeroplane competitions more in evidence this coming season, we shall not be at all surprised to see the biplane once more come into its own.

## Notes.

A correspondent from New York (Mr. F. L. Herrishaff) calls our attention to a matter with regard to which other correspondents have

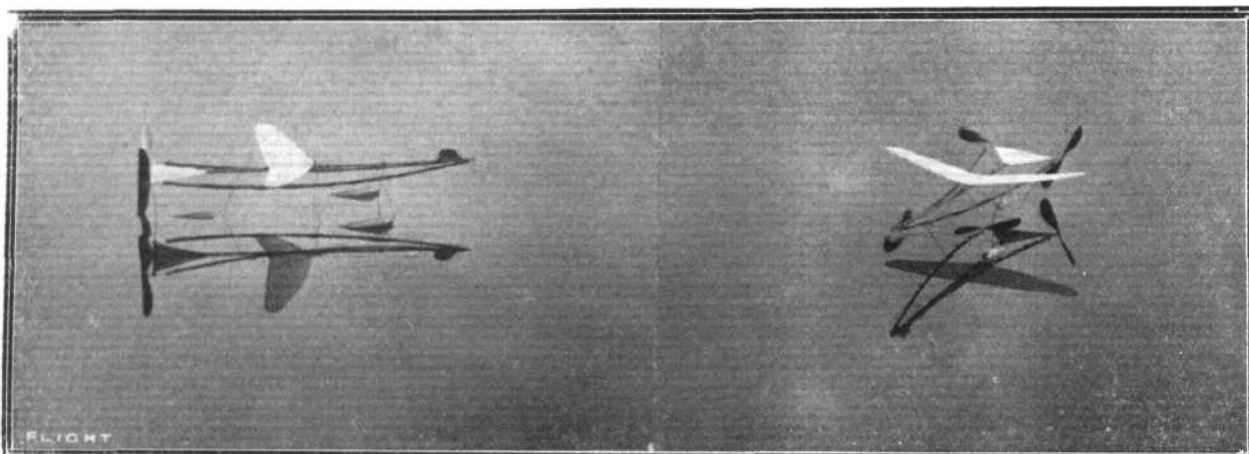
Mr. L. Roche also writes: "After having perused the glowing accounts of some of the Aero Model Clubs—I notice such sentences as these: the model flew 'rather over 1,200 ft.' or 'something above 1,000 ft.' If the flight has been measured—why not give the exact distance. One also reads: the model flew '200' yards or '350.' It looks as if the model just conveniently landed after having actually covered these round figures. It also leaves the impression that the flights have just been guessed at; and I believe that is so in most cases."

We must confess we are in absolute agreement with our correspondent. Surely a distance worth calling such—is of sufficient value to be accurately measured; if it is not, then it certainly cannot be considered worthy of publication.

## Queries.

L. S. LATHROP.—What is the record for a model hydro-aeroplane? who made it? what are the floats made of? and how are they made?

S. M. Gow (21, Westbury Road, Woodside Park, Finchley) desires full particulars and dimensions of a Valkyrie model which has flown with success.



MR. J. C. BALDEN'S HYDRO-AEROPLANE MODEL.—Note the smoothness of the water and the perfect reflection. The model has not as yet "got off"—in fact, very few have so far.

also written, viz., that for secretaries of model clubs to say with respect to their competitions that Mr. S.—'s machine sailed well over 500 yards, and that Mr. J.—'s model climbed beautifully, &c., &c., is quite all right for Mr. S. and Mr. J., and for those who were interested spectators of the meeting, but that it is mighty dry reading for those who are trying to find out about the models, and who do not care a hang about Mr. J. or Mr. S.

We must confess that our correspondents are to the point, and that full particulars about *one* machine are far more valuable to all readers not personally interested than a few bald useless details about half-a-dozen.

## Replies in Brief.

G. S. SHERRIN.—Taking your questions in order. About 8 ins. Two and three, of course, depend on each other; roughly, 1,500 r.p.m. as a maximum. To be popular it should not be more than 1 lb. in weight, say 2 lbs. as a limit. Two mins. at present is ample. Undoubtedly there is danger in carrying a burning lamp under certain circumstances; if it can be dispensed with so much the better.

F. WIEDMANN.—We much regret having mislaid your letter. Will you please repeat query per postcard.

## THE KITE AND MODEL AEROPLANE ASSOCIATION. OFFICIAL NOTICES.

**Baden-Powell Testimonial.**—The Council appeal to members and friends to send in their subscriptions for this testimonial at once to the hon. secretary. The date of the presentation will be announced it is hoped next week.

**Annual Subscriptions and Membership.**—Members are reminded that their annual subscriptions should be paid at once as early payment greatly facilitates the work of the Association.

The membership of the Association is being added to each week, and the Council trusts that members will use their best influence in extending the membership, the benefits to kite and model makers

being: Free entry to all competitions; special fees for observed flights for registration of performances; attend and vote at all meetings of the Association, and take part in all discussions; introduce guests to the Association's meetings and discussions other than those of a business character.

**Competitions Committees.**—The Competitions Committees are meeting each Thursday, at 6 p.m., at the Aeronautical Society (by kind permission) to consider competition rules. These rules will be published very shortly in book form as last year.

W. H. AKEHURST, Hon. Sec.

## PROGRESS OF FLIGHT ABOUT THE COUNTRY.

**NOTE.**—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

### MODEL CLUBS.

**Aero-Models Assoc. (N. Branch)** (Sec., MALCOLM B. ROSS 15, HIGHGATE AVENUE, N.).

BAD weather on Saturday. Duration programme was carried out at Finchley: 1st, A. Haulberg, 68 secs.; 2nd, R. L. Rogers, 46 secs.; 3rd, E. R. Brown, 45 secs. Haulberg's 0-1-1-2L machine covered about 550 yards in 68 secs., and, later, eight Boy Scouts turned up to try to qualify for aviator's badges. The club

wishes to thank the Palmer's Green Aero C. for sending out such a good team. Point-to-point contest at Palmer's Green on March 9th.

Distance open event, Saturday, March 16th, at 3 p.m., Finchley, for Mann set of parts, presented by that firm. No entrance fee.

**Birmingham Aero Club** (Secs., R. COBHAM, G. H. WOOD, 8, FREDERICK ROAD, EDGBASTON).

OWING to high wind last Saturday the junior competition was postponed. Next day, little improvement, but Mr. M. Vale got



some flights, one of 40 secs., finishing with glide of about 10 secs. from a good height. Messrs. E. Trykle, W. Lunn, G. Baker, G. Mason, and Mr. Rogers were also getting good flights, considering the state of the weather.

Mr. E. Trykle has advanced so far with his glider that there is now a keen competition between his party of constructors and Mr. G. Haddon Wood's party as to who shall complete their glider first, and either should be out by the end of March.

**Blackheath Aero Club** (Hon. Sec., A. E. WOOLLARD, 48, HAFTON ROAD, CATFORD, S.E.).

FLYING at aerodromes this week-end as follows: Grove Park—Mr. A. B. Clark, new 5-oz. "A-frame" model; Messrs. H. H. Pizey, A. E. Egelstaff, F. Jarvis, and A. E. Woollard, flying their usual types of model; strong wind made really good flying impossible. Kidbrooke—Messrs. Slatter and Williams made many good flights with "A-frame" models; Mr. Hock obtained his 2nd Class certificate with a flight of 237 yards; Messrs. Peter, Brown, and Cartwright also flying. Lee—Mr. J. A. Dollittle, flying a biplane which he afterwards converted into a monoplane; Mr. F. Peter qualified for his 2nd Class certificate with a flight of 282 yards. After converting his double tractor model into a single one Mr. Whitworth obtained more success. Messrs. Hock and Richards were also flying their models.

To-day (Saturday), "Point-to-Point" competition for club members only, at 3 o'clock, at Kidbrooke ground.

The W. H. C. prize model will be awarded to the junior, or novice, who makes the best duration flight at any of the club's grounds during week-ends before April 15th. All members, irrespective of age, who have not made an observed flight of 250 yards, will be eligible to compete. It has been decided to form an Information Bureau for the use of members; all enquiries should be accompanied by a stamped and addressed envelope, and such enquiries should be sent to the hon. sec.

**Brighton and District Model Ae.C.** (Hon. Sec. A. VON WICHMANN, "KINGSLEIGH," KINGSWAY, HOVE.)

REGULATION 30 m.p.h. March wind blowing on 2nd. Shoreham Aerodrome is a big place, but one of Mr. Bate's small monoplanes flew very nearly end to end. Mr. Frost was getting 60 and 70 yards out of his tractor Antoinette. Mr. White also out with tractor. Competition for Mr. Townsend's Aero prizes of £1 and 10s. open till Easter, flown for on duration formula.

**Bristol Model Flying** (Sec., R. V. TIVY, 3, ROYAL YORK CRESCENT, CLIFTON).

MEETING on March 2nd. Flights by Messrs. Howse (24 secs.) Easterbrook and others in boisterous wind. Pending arrangements for more suitable flying ground, meetings will be held at Sea Walls fortnightly, dating from March 9th at 3 p.m.

**Coventry Aeroplane Building Society** (Sec., J. W. SCHOFIELD, 22, KINGSTON ROAD, EARLSDON).

AN exhibition of models and parts of full-sized machines will be held in Corn Exchange, Smithford Street, March 30th, to be opened by the Mayor of Coventry. Address on "Aviation" by Rear-Admiral Bacon, of Coventry Ordnance Works. Humber Co., Ltd., will show 2 engines. Silver medal, value 10s., offered by Mr. W. A. Weaver, for best model by amateur (not member of the Society) for design and workmanship, also 3 certificates next in order of merit. Mr. H. P. Holland whose design has been accepted for club glider, has consented to act as Official Instructor to the Society. 16 new members have joined the Society from the Ordnance Works last week. Tickets going splendid, 1,000 already sold. Society in need of funds to obtain larger workshop and to offer greater facilities of educating the people in the science of aviation.

**Dover and District Model Ae.C.** (Sec., H. D. DAVIS, "OAKVILLE," GODWYNE ROAD, DOVER.)

COMPETITIONS for to-day (Saturday) weather permitting: 1. Pair of 8-in. propellers for best all round construction; 2. Triangle fuselage for landing nearest a given spot; 3. Elevator and pair of propellers for height and best *vol plané*; 4. One dozen yards of elastic for best biplane flight (about 18-in. span); 5. Triangle fuselage for best flight made by single screw; 6. Fittings for model aeroplane exhibiting best stability, duration, and control. Meeting starts 2.30 p.m. These competitions are not for flying sticks, but are intended to bring out all the good qualities of a real aero model. We are pleased to state that we have not a single freak in the club, and do not want one.

**Ealing and District Ae.C.** (Sec., B. J. KIRCHNER, 1, QUEEN'S GARDENS, EALING, W.)

SIXTEEN members were at meeting on the 2nd. L. Roche's model and C. Chilcott's model flew very well. The latter on two occasions nearly beat the club record for distance, held by L. Roche, by flying 924 feet (measured). C. Davies flew a small model, G.

Beeching his old model, L. Kirchner and C. Roche both bringing models.

His Worship the Mayor of Ealing, Councillor G. Taylor, has consented to be the President of Club. The club records are as follows: distance, 1,030 ft.; duration, 45 seconds, both held by Mr. L. Roche with his 3-oz. monoplane.

A contest with Paddington and District Aero Club the 23rd, or this month.

To-day (Saturday) a meeting as usual.

**Hackney and District Aero Club** (Sec., B. H. LONGSTAFFE, 47, JENNER ROAD, STOKE NEWINGTON, N.)

No flying Saturday owing to weather. Steering and stability next week, weather permitting.

**Higher Broughton Model Soc.** (1, ESKRIGGE ST., MANCHESTER).

AT a meeting on 2nd inst., the resignation of Mr. W. M. Blumenfeld (secretary) was accepted with regret; and Mr. L. H. Martin now takes the position.

**Reigate, Redhill and District Aero Club** (Sec., H. V. MAY, 4, LONDON ROAD, REIGATE).

ON Thursday, Norton, May and Lewis, with May's "Baby," succeeded in getting a "rocky" 350 yards in a very heavy wind. A debate was held during the week on Wing Construction and Methods of Fastening. Flying as usual on Saturday (to-day) at Earlswood, at 2 o'clock.

**Paddington and Districts Ae.C.** (Sec., W. EVANS, 133, BUCHANAN GARDENS, HARLES DEN).

REARRANGEMENT of competition: Duration contest with Ealing and District Club altered to March 23rd, and club competition for juniors and novices to March 30th. List of members selected by committee as eligible to compete in latter, posted in workshop.

New member elected Mr. M. Levy, Sutherland Avenue.

In reply to a suggestion of Kite and Model Aeroplane Association to hold trials on grounds of other London clubs, an invitation was sent to them to hold next trials on our private flying grounds at Parkside.

Tests for certificates decided as follows: Superior class, distance  $\frac{1}{2}$  mile, duration, 100 secs. 1st Class—1,000 ft. and 50 secs. 2nd Class—500 ft. and 25 secs. Separate flights for distance and duration.

Gift of four aeronautical books for library from the President gratefully accepted.

This evening (Saturday) at workshop, reception by the President, Mr. V. E. Johnson, M.A.

**Palmer's Green and District Model Ae.C.** (15, MOFFAT RD., N.).

LAST Saturday week it was decided to postpone the steering competition, as practically everyone had "turned out" light duration models. Prominent amongst these members were E. R. Brown and H. Lingard. The former made some startling flights with his original 2½-oz. model, which he flew on seven strands  $\frac{1}{4}$  in. strip. His two best duration flights were 85 and 92 secs. H. Lingard was also using a 2½-oz. machine, and Messrs. B. Brown and A. Trollope were trying new models. "Point-to-point" competition on March 9th.

Last Saturday some of our members paid a visit to the Aero Models Association's ground at East Finchley to compete for duration. Second and third places were taken by Messrs. R. L. Rogers and E. R. Brown, with flights of 46 secs. and 45 secs. respectively. Mr. Brown's light 2½ ozs. model was placed at great disadvantage owing to the gale which was blowing during the afternoon.

Mr. E. R. Brown still holds club "Duration" record with 92 secs. made on February 24th with a 2½-oz. model.

Point-to-point competition on March 9th.

**Stony Stratford and District Kite and Model Ae.C.** (Hon. Sec., O. HAMILTON, JUN., OLD STRATFORD).

THE exhibition of models, kites and accessories on February 29th, at the Baptist Church schoolroom was highly successful in every respect. The entries comprised for the three classes: monoplanes, 17; biplanes, 4; kites and accessories, 17; including two scale models, a Blériot XI and Santos Dumont Demoselle. In the biplanes Mr. T. A. Moore's "Yellow-Bird," a pretty little one-ounce machine was interesting. Amongst the monoplanes there were three or four Mann type, 31 built from designs as published in FLIGHT, &c. In the kite section, Mr. Brown was represented by six exhibits, ranging from a 9 ft. by 7 ft. to the small 2 ft. 6 in. by 2 ft.

Meeting March 14th; first business, election of new Chairman in the place of Mr. R. W. Field who has resigned owing to his leaving the district.

**Scottish Ae.S. Model Aero Club** (6, McLELLAN STREET, GOVAN).

LAST week has been exceptionally busy. On the 28th ult., Mr. C. Arthur made the first flight from water with his new hydro-aeroplane. On 29th, the smoking concert was held, Col. J. A. Sillars was in the chair, and several prominent members of the

Scottish Aeronautical Society were also present. On 1st inst., Mr. A. Forson opened a discussion on "Chassis Design," and many points of interest and importance of this useful member were thoroughly discussed.

On Saturday forenoon Mr. Balden's hydro-aero got off the water. Rising in about 10 secs. to a height of 15 ft. it made a remarkable flight which ended in the trees at the opposite side of the pond. Mr. Arthur also made some flights from the water. In the afternoon there was a model flying meeting at Ibrox. Good flights by Messrs. Balden, Langlands, Graham and Boyd. Mr. Gordon was kite-flying. Afterwards some remarkable model flights were made by Messrs. Balden and Langlands from the hill in Bellahouston Park. The third competition for the aggregate prize Saturday, the 16th, at Barrhead Aerodrome. Events, distance and duration.

The second half of the session has now commenced and intending members can now be enrolled. Subscription for half session ending September, 4s. Full particulars from the hon. sec., Mr. W. Foster, Rochelle, Limeside Avenue, Rutherglen.

**Worcester Model Aero Club** (Sec., S. A. SEARS, VICTORIA INSTITUTE, WORCESTER).

ON 2nd inst. only those possessing high-powered models could battle against the strong wind which blew half a gale. Mr. Pollard raised the club record to 220 yards. Competition was postponed to the 9th, at usual meeting on Pitchcroft at 3 o'clock.

**Sheffield Model Aero Club** (Hon. Sec. C. F. W. CUDWORTH, 35, PENRHYN ROAD, SHEFFIELD).

A GENERAL meeting of the club at "Broomhead's" Dining Rooms, Leopold Street, March 14th, at 7.30 p.m. All interested in aeronautics and model flying invited to attend. One of the main items on the programme is that the secretary will give away to those present detail drawings for making a successful flying monoplane designed by Mr. T. Pashley, who will also be pleased to give any further instructions for constructing the same. Some aeronautical literature will also be given away. Next model flying competition probably on Easter Monday.

**Yorkshire Ae.C. (Model Section)** (5A, HULLAND ST., LEEDS).

ON February 27th, Dr. Vaughan Bateson, of Bradford, gave a lecture on "Flight: Past, Present, and Future." Mr. S. A. Hirst, Chairman of Y. Ae. C. in the chair. Dr. Bateson spoke upon the most important events of the past three years, showing the remarkable advance in the science of Aeronautics during that period. Both the aeroplane and airship were freely dealt with, interest being added by the speaker relating a few of his experiences in both classes of aircraft. At the close of the meeting, a vote of thanks was unanimously passed to Dr. Bateson for his most interesting chat. On March 12th, at the Hotel Metropole, Mr. Robert Blackburn, of the Blackburn Aeroplane Co., Leeds, will speak on "Pickings from Practical Experience" at 8.30 prompt.

The secretary would be very pleased to hear from young men in Leeds and District interested in matters aerial, with view to increasing membership.

## CORRESPONDENCE.

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

### Twin Propellers.

[1505] It is understood that where two propellers (or tractors) are used on an aeroplane, as shown in FLIGHT, page 29, there is a certain amount of loss; that is, for double the horse-power something less than double the thrust would be obtained.

Can anyone tell me what is the percentage of loss, and whether it is constant?

Also, in a *vol plane* does the propeller revolve or not? and if not, what resistance does it offer to the machine? ENGINEER.

### Soaring Flight.

[1506] In carrying out experiments with a model glider of new design, I found that it possessed the faculty of soaring flight, and in the apparent absence of wind rather than in its presence. I was somewhat surprised at this, and began to study the conditions which produced this soaring, and observed that it was manifested in the most marked degree in bright sunshine following a heavy dew or light showers, and that it was generally apparent in some degree when the atmosphere was moist and the temperature rising. From these observations I came to the conclusion that soaring was associated with the expansion of the water vapour present in the atmosphere, and from experiments ascertained that under certain conditions, the passage of a body through water vapour, hastened its expansion and caused some electrical action to take place.

On reading of Dr. Hankin's explosion or decomposition theory,

it appeared that my observations and conclusions were in part in agreement with his, and I should now be greatly interested to know if any particular degree of moisture would be present in the country and under the condition in which Dr. Hankin observed soaring flight in the apparent absence of wind.

I have reason to suppose that the more rarified is the water vapour the more readily does it expand on being disturbed, when the temperature of the air carrying it is rising, and this would account for what is, I believe, the fact, that soaring flight, in the absence of wind in any quantity, is only possible at a certain altitude.

Hampton-on-Thames.

C. WALPOLE DRURY.

### Bird Flight.

[1507] Now that we are all discussing with interest Dr. Hankin's observations and theories, the following observation may be of interest to your readers.

On Sunday, February 4th, I was walking along the shore of the Forth, near Granton, when I noticed two gulls circling exactly like hawks, rising higher and higher without any flapping, except one or two slight flicks when going to windward. Their paths were in opposite directions and intersected each other.

It was one of those bright frosty days when your hair crackles with electric discharges when it is brushed. In fact, I specially noted this fact on the present occasion. The wind was very slight and from the south. Snow on the ground. The gulls worked gradually to windward. I have watched their flight for two or three months but never noticed anything so hawklike in their movements. Edinburgh.

J. C. ANTINORI, A.M.I.C.E.

(Other correspondence is held over owing to pressure on our pages.)

### PUBLICATION RECEIVED.

"Off for the Honeymoon." Two-Step. By Carlotta Rowe. London: Metzler and Co., 42, Great Marlborough Street, W. Price 2s. net.

### Aeronautical Patents Published.

Applied for in 1911.

Published March 7th, 1912.

7,593.	— AYLESBURY. Instinctive gravity control for flying machines.
8,326.	A. WENDTLAND. Airship.
9,691.	V. ALEXIEFF. Steering, or direction-recording apparatus.
13,959.	G. GLUECKSMANN. Driving device for airships, &c.
18,123.	R. ESNAULT-PELTERIE. Landing devices.
20,902.	V. P. AMILHAU. Projectiles for military aviation.
25,930.	M. KALABA. Aeroplanes.

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